

Dental

Abstracts

a selection of world dental literature



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*Lon W. Morrey, D.D.S., editor
N. C. Hudson, assistant editor*

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AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana, under the act of March 26, 1956. Change of address notices, undeliverable copies, orders for subscriptions, and other mail items are to be sent to editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription \$8.00 a year in U.S.A.; \$9.00 outside U.S.A. Single copy \$1.00. Issue of January 1961, Vol. 6, No. 1. Copyright 1961 by the American Dental Association. All expressions of opinion and statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

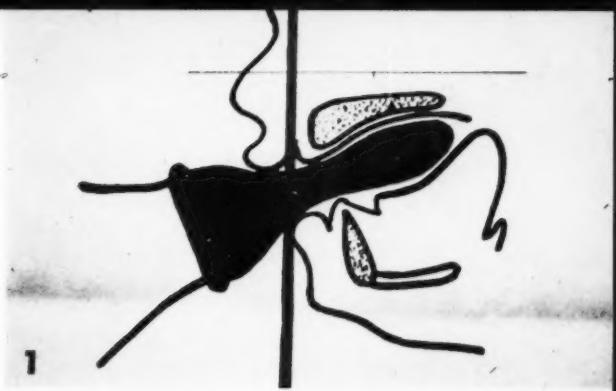
**Dental
Abstracts
has
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purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
2. *To provide, by a few hours' reading, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
3. *To supply enough data in each abstract and digest that the reader may determine whether he wishes to refer to the original article for more complete information.*

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of current knowledge in the various specialties. Unless otherwise indicated, the original article is in the language implied by the title of the magazine in which the article appeared.

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Malfunction of the tongue. Part 1.
The abnormal swallowing habit: its cause, effects, and results in relation to orthodontic treatment and speech therapy

Walter J. Straub. *Am.J.Orthodont.* 46:404-424
June 1960

In an effort to determine the cause of abnormal swallowing habits, the case histories of 478 children, with such habits, seen between June 1943 and January 1957, were studied.

Of the 478 patients, all but two had been bottle-fed. Thirty-three patients were breast-fed and given supplemental bottle feedings for a period of two to six weeks, after which time they were fed solely on the bottle. In a great many of these patients the anterior segments of both arches had been affected. Either there was a severe open bite due to a protrusion of the upper anterior teeth, or the anterior segments of both arches were protruded with spaces between the incisors and canines. Many of the patients sucked their thumbs and had an extreme protrusion of the upper anterior teeth; there was little room to accommodate the tongue in its proper position in the palate. Instead, the tongue rested on the lower teeth. In many patients the palate was so narrow and ill-formed that even if the patient had wanted to put his tongue against the roof of his mouth, he could not do so.

The abnormal swallowing habit usually is accompanied by a narrow upper arch and, often, a severely contracted maxilla with upper teeth protruding in an open bite relationship.

The abnormal swallowing habit definitely is the result of improper bottle feeding. Particularly responsible is the long nipple with several holes (Fig. 1). An infant's mouth is very small, and a long nipple, which fits halfway down the throat, will not let the infant put his tongue against the roof of his mouth. He cannot suck and swallow



Figure 1 A type of long nipple that has caused many bottle-fed infants to develop abnormal swallowing habits

Figure 2 A short nipple with one hole may prevent the abnormal swallowing habit

Figure 3 With the short nipple the infant must suck for his milk. His lips and face press against a rubber padding which simulates the breast

properly for, as he sucks, the milk flows so freely that he will either regurgitate and choke or spill the milk out of the sides of his mouth. In self-defense, the child puts his tongue forward and grasps the nipple between his jaws and tongue and swallows with his tongue in this position. Children who swallow this way from birth may go through life swallowing abnormally.

An abnormal swallowing habit may be prevented by the use of a very short nipple (Fig. 2). Since this nipple has only one small hole, the infant must suck for his milk. Also, his lips and face will press against a rubber padding which simulates the breast (Fig. 3). With this type of nipple, the child receives the same amount of milk he would from the breast. Since children who nurse with these nipples receive less air, they seldom have an excess of milk in their mouth, seldom regurgitate, have colic less frequently, and seldom burp. The recently introduced "No-Vac Nurser" bottle has a valve in the bottom which helps to eliminate air colic and allows the milk to flow steadily without creating a vacuum.

Abnormal swallowing does not disappear spontaneously as the child grows older. There are many variations of the abnormal swallowing habit, and it may go unsuspected all through life, since many patients who swallow abnormally never develop an open bite.

The abnormal swallowing habit should be detected and corrected as early as possible to facilitate normal development of palate and dentition. When detected early, the habit should be corrected by habit control or by lessons designed to teach the child to use the proper muscles of deglutition and to place the tongue in its proper position.

Abnormal swallowing is a difficult habit to correct in older patients. There is some danger that patients who have swallowed incorrectly for 14 to 16 years may return to the old habit after all orthodontic appliances have been removed, unless the patients are checked from time to time during treatment and referred back to the therapist until the abnormal habit is corrected.

No. 2, El Cerrito, San Mateo, Calif.

A public health orthodontic survey

J. A. Salzmann. *Am.J.Orthodont.* 46:548-549
July 1960

David B. Ast, consultant to the American Association of Orthodontists' committee on public health, has outlined a suggested study to be undertaken by the association to determine the prevalence of physically handicapping defects requiring orthodontic interference. The availability of personnel and facilities to provide such orthodontic care also would be determined.

"The rehabilitation of children with physically handicapping defects has been the concern of state authorities throughout the nation," said Dr. Ast. "While the details of state laws governing rehabilitation may vary, they are essentially comparable in their definitions of what constitutes a physical handicap. Only within recent years, however, have dental defects requiring orthodontic

care been considered among the physically handicapping defects.

"In order for the American Association of Orthodontists to lend its most effective support in this public health approach to orthodontic care, it would be helpful to know something about the extent of this problem and what is needed to provide adequate corrective care."

The eight regional societies of the association will be asked to cooperate in the survey. The sampling will be based on age, race, color, socio-economic level and area of residence (urban or rural). Youth in the age group from 12 to 16 years old will be surveyed.

The board of directors of the American Association of Orthodontists accepted the report and voted to support the proposed survey. Communications relative to the survey should be mailed to the author.

654 Madison Avenue, New York 21, N.Y.

**Roentgenographic examinations
of edentulous jaws:
use of a roentgen network**

Juraj Kallay. *Deut.zahnärztl.Zschr.* 15:447
Feb. 15, 1960

Taking roentgenograms of both jaws of edentulous patients before constructing complete dentures has become a routine procedure in prosthetic dentistry. However, roentgenograms frequently are taken in general dental practice to locate root fragments or remnants and foreign bodies and to determine whether pathologic changes have taken place in the bones of the maxillofacial region.

Roentgenographic examinations of edentulous jaws often present difficulties. Attempts to obtain information about the exact site where surgical intervention is required in edentulous jaws often are met by unexpected obstacles that make the correct interpretation of the roentgenogram impossible. Various means have been devised to facilitate determining the exact location of foreign objects or pathologic changes. So far none has proved absolutely successful.

Realizing that most pathologic changes, as well as impaction of root fragments or remnants, occur

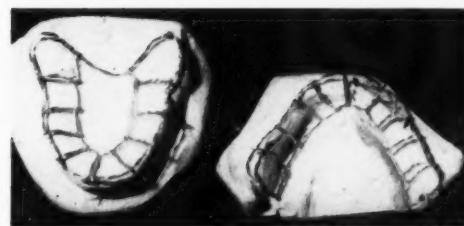


Figure 1

in the alveolar portion of the involved jaw, the author constructed a network designed to facilitate roentgenographic detection and localization of root fragments and remnants, as well as of suspected pathologic changes.

Two different basic types of the network were made, one for the lower jaw and the other for the upper jaw. The horseshoe-shaped network (Fig. 1) should be inserted in the mouth prior to taking the roentgenogram of an edentulous jaw.

The network is divided into several squares. The object being sought will appear in the roentgenogram in one of the squares. Thus the exact location can be determined prior to surgical intervention (Fig. 2 to 4).

The network is made of soft Wipla wire and can be sterilized after use.

In difficult instances, specific networks can be constructed for the patient, according to his individual requirements, and placed on the jaw during the operation. This facilitates not only precise interpretation of the roentgenogram but also performance of the operation without difficulties.

To obtain the exact location of the object (whether root particle or pathologic lesion), it is important to establish a point of orientation in

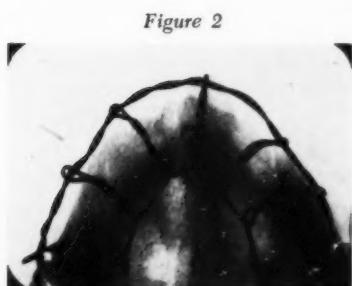


Figure 2



Figure 3

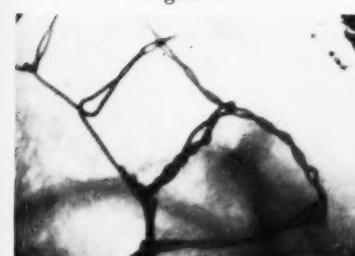


Figure 4

relation to the network. The midline (frenulum) offers a favorable point of orientation.

By inserting such networks over edentulous jaws prior to roentgenographic examinations, residual infections, impacted or unerupted teeth, supernumerary teeth, cysts (residual root cysts, anterior palatal cysts and mucous cysts of the antrum), foreign bodies (amalgam particles, broaches, pieces of impression material and buckshot), benign and malignant tumors, and retained roots (fragments and remnants) were localized. Most of these had not been observed clinically.

The indication for the use of networks for complete mouth roentgenograms of edentulous patients is emphasized.

Lascinska 63, Zagreb 3, Yugoslavia

X-ray protection techniques

Walter R. Stahl. *Pub. Health Rep.* 75:513-526

June 1960

Oregon's radiation law, effective July 1, 1957, authorized a two year study of radiation exposure before promulgation of regulations and standards. This paper discusses technical aspects of the survey of diagnostic x-ray units.

Highly trained personnel are required for inspection of diagnostic x-ray units. The chief of such a program should have formal postgraduate training in radiobiology.

The typical medical or dental practitioner or veterinarian has had little formal training in taking and processing roentgenograms. A written statement on the essentials of radiation protection, and a checked recommendation form, are left with each practitioner.

The Oregon survey revealed few instances of gross overexposure for operating personnel. Although the so-called dental film monitoring method has been widely used, it does not replace the use of film badges. In the dental film monitoring method, a paper clip is affixed to a plain dental film which is carried in a pocket for a week or two and then developed. An outline of the paper clip, which appears at an estimated exposure of 25 to 40 mr, is considered a positive result.

In offices with small caseloads, special personnel protection devices may not be necessary. In offices with a normal to heavy workload, a leaded

barrier is recommended. It need not be expensive, since a lead sheet or lead-faced plywood can be purchased and installed by the owner.

Dental x-ray units may pose some difficult problems in personnel protection. Because of space limitations and a desire to watch the patient during roentgenography, many dentists consider protective shielding awkward. For caseloads averaging not more than 10 to 20 dental roentgenograms a week, experience indicates that a long timer cord on the unit, allowing the technician to stand 7 to 10 feet away, may be adequate protection provided there is a good tube head and careful use. R. O. Gorson (1959) reported that exposure to dental personnel rarely exceeds 300 mr per week, even in offices with minimal or no protection. An adjacent thick plaster wall may serve as shielding. Much depends on the design of the x-ray unit.

For heavier workloads, installation of a shielding device is recommended. A hinged, leaded plywood sheet may be attached to a wall, or shielding may be built onto an existing partition.

Personnel exposure and patient exposure present different protective demands.

Collimation of the roentgen-ray beam probably is the most important single factor in reducing patient exposure. Limitation of beam size for dental x-ray units can be accomplished readily. Most dental units, however, have unnecessarily large beams although there is a plastic pointer on the outside, and a lead washer often has been installed. A 2% inch field diameter at the patient's jaw is advised. A 16 inch tube-to-skin distance is preferable to reduce parallax errors, but an 8 inch distance is much more commonly used. Restriction of beam size is easily achieved by inserting a heavy lead washer inside the plastic pointer cone, the washer being of a size calculated to produce the recommended field diameter. Additional local shielding is not indicated for dental work.

Another step that reduces patient exposure is insertion of a filter of 2 mm. of aluminum into the roentgen-ray beam. Provided a unit is used at kilovoltages higher than about 70, no change in exposure is required on insertion of 2 mm. of added filter, even where none was used before. At lower kilovoltages, some small increase in milliamperage and time of exposure may be necessary. Many dental units operate at 55 to 65 kv.

and with these the addition of 2 mm. of aluminum may cut down output to a level where exposure time becomes excessive. The current recommendations for dental machines, issued by the National Committee on Radiation Protection, call for total filtration equivalent to 1.5 mm. of aluminum. Most new units include the required permanent filters.

Experience in the Oregon survey has revealed that a majority of x-ray films are not properly processed. To utilize the full speed of the emulsion, the film must be fully developed, which means five minutes at 68°F. Full development may be obtained at 75°F. in less than three minutes, but with some increase in grain size and fogging. If full development, fast film and other innovations are used, exposure time and milliamperage used in the tube, or both of these, may be decreased.

An advantage of higher kilovoltage is that the resulting beam is more uniform and penetrating. This increases the ratio of useful negative image to patient exposure. Since most dental x-ray units operate at a low, fixed kilovoltage in the order of 55 to 70 kv., no major change in voltage is possible unless the unit is replaced. The newest dental units are adjustable and go up to 90 kv.

University of Oregon Medical School, Portland, Ore.

A 65 or a 90 kilovolt x-ray machine?

Henry D. Spangenberg, Jr., and M. L. Pool.
Oral Surg., Oral Med. & Oral Path. 13:552-565
May 1960

The quality of dental roentgenograms is affected by the kilovoltage at which the x-ray machine is operated and by external filtration of the roentgen-ray beam. Investigations indicate that

roentgenograms with the best diagnostic characteristics are produced either by a 65 kilovolt (kv.) machine operated at 70 kv. or a 90 kv. machine operated by 90 kv. when the beams are filtered by copper and aluminum.

Although it is true that such roentgenograms possess less over-all contrast, and therefore may be less pleasing psychologically, a greater amount of information is available in such roentgenograms.

Use of the Victoreen "r" meter indicates that less radiation is required to produce a diagnostic roentgenogram when a filtered beam is used. Of three filter configurations examined, the best consists of 0.375 mm. of copper and 0.5 mm. of aluminum. Spectral analysis with the scintillation spectrometer demonstrates that the reduction in dosage occurs as a result of the elimination by filtration of much of the low-energy part of the white radiations emitted by dental x-ray machines. If the roentgen-ray beam is unfiltered by added external filtration or is filtered by 0.5 mm. of aluminum added filtration, the radiation dosage required to produce equivalent roentgenographic film densities is less when the radiation from a 90 kv. machine is used in place of the radiation from a 65 kv. machine operated at 70 kv. Under these filter conditions, it would seem that the inclusion of a 90 kv. machine in the diagnostic armamentarium of the general practitioner of dentistry is indicated.

If the roentgen-ray beam is filtered by 0.375 mm. of copper and 0.5 mm. of aluminum, the radiation dosage required to produce equivalent roentgenographic film densities is the same for both x-ray machines. Under this filter condition, the 65 kv. machine operated at 70 kv. is a reasonable substitute for the 90 kv. machine.

College of Dentistry, Ohio State University, Columbus, Ohio

Anesthesia
and analgesia**Development and clinical investigation
of a new oral surface anesthetic for acute
and chronic oral lesions**

Irwin I. Ship, Anderson F. Williams
and Boris J. Osheroff. *Oral Surg., Oral Med.
& Oral Path.* 13:630-636 May 1960

Various concentrations of four antihistamine compounds and dyclonine hydrochloride were prepared in isotonic sodium chloride solutions for initial screening purposes. Fifteen patients with severe recurrent aphthous stomatitis were studied for six months. Because of the random nature of the treatment sequence, not every patient received each drug. Analysis of results indicated excellent depth of anesthesia with lidocaine hydrochloride and dyclonine hydrochloride, and inadequate anesthesia when diphenhydramine hydrochloride was used.

The results suggested that a combination of the pharmacologic effects of dyclonine and diphenhydramine would be desirable.

An isotonic sodium chloride solution containing 0.5 per cent diphenhydramine hydrochloride and 0.5 per cent dyclonine hydrochloride was studied for anesthetic potency and duration in 45 patients with painful oral lesions. The patients were observed for periods ranging from 7 to 540 days.

Onset of effective anesthesia occurred within three to seven minutes after application of the anesthetic solution to the lesions, or after use of the solution as a mouthwash. Depth of anesthesia ranged from excellent to poor; occasionally, it was found to be excessive. Duration of effective pain relief was about one hour. One of the patients, a 35 year old woman who later reported having experienced an allergic reaction to antihistamines taken previously in "cold tablets," developed acute swelling of both lips associated with multiple severe ulcerations, malaise, fever and headache. The symptoms disappeared spontaneously within 24 hours after withdrawal of the medica-

tion. Five other patients reported sensations of dryness of the mouth, and three patients reported excessive salivation.

An isotonic sodium chloride solution, containing 0.5 per cent diphenhydramine and 0.5 per cent dyclonine, gave adequate to excellent relief from pain for the majority of 45 patients with painful oral lesions. These patients either administered the solution directly to the oral lesions with cotton-tipped applicators, or used the solution as a mouthwash.

*National Institute of Dental Research, Bethesda
14, Md.*

Intravenous anesthesia in oral surgery

Joachim Haym. *Fortschr. Kiefer. Ges. Chir.*
5:75-79, 1959

Many oral surgeons have encountered instances of syncope after an anesthetic injection, and usually they have attributed the toxic reaction to the properties of the anesthetic solution used or to the patient's systemic condition or psychic disturbance.

The fact is often overlooked that most toxic reactions to local anesthesia are the direct results of an accidental intravenous injection introducing the anesthetic agent into the blood stream which carries it directly to the heart and the cerebral centers.

The toxicity of local anesthetics is profoundly increased when injected into a vein. An intraarterial injection of an anesthetic agent is about 4 times as toxic as a subcutaneous injection, whereas an intravenous injection increases the toxicity to 16 times that of a subcutaneous injection.

It would be an inexcusable mistake to transfer the popular concept of "minor" surgery to anesthesiology. There is no such thing as minor anesthesia.

About 30 years ago, intravenous anesthesia by injection of a barbiturate directly into the veins, was suggested by many authors as applicable to dentistry, especially oral surgery. Immediately, other authors warned against the indiscriminate use of both the barbiturates and the intravenous method, especially against their casual employment in dental practice.

These warnings remain valid today, although intravenous anesthesia has been used and is used readily and successfully in many dental and oral surgical clinics, especially for surgical procedures requiring only a short duration of anesthesia.

The intravenous injection of the prompt but short-acting soluble barbiturates or thiobarbiturates to obtain basal anesthesia for oral surgical interventions requires special knowledge and experience which are seldom acquired by dental practitioners.

Under the supervision of an experienced anesthetist, short-acting barbiturates and ultra-short-acting thiobarbiturates may be used for intravenous anesthesia with an adequate margin of safety.

Saarstrasse 21, Mainz, Germany

Effects of high carbon dioxide concentrations on blood circulation and respiration during anesthesia: tolerance and 'supercarbia'

Gerald R. Graham, Dennis W. Hill and John F. Nunn. *Anaesthetist, Berlin* 9:70-73 Feb. 1960

Fifteen young mongrel dogs were lightly anesthetized either with pentobarbitone sodium or, after induction with thiopentone, with one of the inhalants (ether, halothane or cyclopropane). The experiments were carried out at the Research Institute of the Royal College of Surgeons of England in London.

Increasing concentrations of carbon dioxide, in steps of 5 per cent every 5 minutes to a maximum concentration of 75 per cent, were then added to the gas mixture which, besides the inhalants, contained only oxygen.

The inhalants differed in the degree to which they reduced the stimulatory effect of carbon dioxide on minute volume. The reduction was most profound with ether and least profound with cyclopropane.

The peak stimulatory response to ventilation was reached when the carbon dioxide concentration was 25 per cent. The increase in the minute volume was obtained in some dogs by an increase in the rate and in other dogs by an increase in the tidal volume. A further increase in the minute

volume occurred if the inhalant was withdrawn at a carbon dioxide concentration of from 20 to 25 per cent, at which level the gas acts as an anesthetic.

The stimulating effect of carbon dioxide then gradually decreased. At a concentration of about 40 per cent, respiratory arrest supervened. If artificial ventilation was maintained and the carbon dioxide concentration was further increased, spontaneous respiration recommenced, usually at a carbon dioxide concentration of from 60 to 70 per cent, and a minute volume which approximated the control values.

At this stage, for which the term "supercarbia" was created, the arterial and venous pressures, heart rate and rhythm and respiratory minute volume remained constant for more than one hour. Cutting of the vagi during this stage in three dogs produced the typical slowing and deepening of respiration.

Slow decrease in the carbon dioxide concentration to elimination led to the re-establishment of a normal respiratory pattern, after a short period of stimulation when the carbon dioxide concentration was reduced below 30 per cent (mirror image of the respiratory response at the onset of anesthesia when the carbon dioxide concentration had been increased).

As soon as the animals showed signs of awakening, the anesthetic agent was re-introduced into the gas mixture. When the concentration of carbon dioxide in the inspiratory mixture had reached 70 per cent, the pH had fallen to between 6.2 and 6.5.

Further experiments with dogs have demonstrated that spontaneous respiration is resumed about 20 minutes after a respiratory arrest, if the concentration of carbon dioxide (at that moment about 40 per cent) is maintained.

In another group of dogs, respiratory arrest did not occur, although the experimental conditions were identical, and the characteristic "supercarbia" pattern of relatively slow, deep breathing was gradually reached and maintained up to carbon dioxide concentrations of 70 per cent.

During the anesthesia, various dental and oral procedures were carried out.

Research Department of Anaesthetics, Royal College of Surgeons of England, London, England

Points on the care of hypodermic syringes and needles

Indust.Nurses J. 8:5:31 May 1960

To clean a syringe:

1. Immediately after use, flush syringe and needle two or three times, or until all traces of medication disappear, with a commercially accepted neutral (pH 7) cleaning solution. If the needle is stained with blood, flush the needle first with cold tap water to avoid getting blood in the cleaning solution. The use of enameled pans should be avoided, as small particles of enamel may chip off and clog the needle or syringe.

2. Separate needle and syringe parts and soak in the cleaning solution for 5 to 20 minutes. Any soil not removed should be brushed or wiped away.

3. Assemble the syringe and flush with cleaning solution. Rinse under running tap water, then flush with distilled water or alcohol. The unit now is ready for sterilization.

To remove a stuck needle:

1. The syringe and needle are soaked for 5 to 20 minutes in a neutral cleaning solution.

2. The square part of the needle is grasped firmly in a pair of pliers or forceps.

3. The pliers or forceps is held firmly and the syringe (not the forceps) is rotated counterclockwise. Force must not be used.

A 10 per cent solution of nitric acid will remove alkali deposits. A 10 per cent solution of hydrochloric acid will remove arsenic and iron stains. A 10 per cent solution of nitric acid will remove methylrosaniline chloride stains. Blood stains can be removed either with a 10 per cent solution of nitric acid, or with sodium citrate, or with concentrated ammonia. The syringe or needle should be swabbed carefully with a cotton applicator dipped in the solution, and rinsed after each swabbing. The solution should not be permitted to come in contact with any of the metal parts of the syringe. A glass syringe should never be left immersed in strong acids or alkalis. Syringes with metal parts should not be left immersed in solutions containing mercury or ammonia.

To repair a needle point:

1. A 4X magnifying glass is used to detect

burs, "fishhooks" and dull, broken or misshaped points. To remove burs from the inside edges, a pointed stylet, trocar or discarded needle is used.

2. A hard, smooth Arkansas oil stone is used to sharpen a needle. A light mineral oil on the stone hastens sharpening and gives a smoother finish. The needle bevel is placed flush on the stone at the proper angle and is slid backward, forward and laterally across the stone so that grooves are not worn in the stone.

To clean a needle:

1. Flush with cold water immediately after use.

2. A stylet or needle wire is inserted through the needle to make sure the cannula is not clogged. Wires should be inserted through the hub, not from the point.

3. The needle is washed with a neutral cleaning solution, then it is attached to the syringe and the cleaner is flushed through the needle. The inside of the hub is cleaned with a tightly wound, cotton applicator. The needle is flushed and rinsed with clear water.

4. To remove stains, a fine powdered or caked household abrasive cleanser is used; the needles are then rinsed thoroughly. Needles that are clogged with medications or blood should be soaked for 5 to 20 minutes in cleaning solution before the final washing.

5. The needle is flushed with alcohol or with air.

170 East Sixty-first Street, New York 21, N.Y.

Use of Sernyl in clinical anesthesia

M. Johnstone. *Anaesthetist*, Berlin 9:114-115
March 1960

Sernyl, 1-(1-phenylcyclohexyl)piperidine hydrochloride, is an anesthetic agent recently synthesized in the United States.

Comprehensive investigations of the drug's effects in several animal species had been previously carried out at the Royal Infirmary of Manchester, England, and had revealed a potent anesthetic activity without evidence of cellular toxicity. The intravenous injection of from 0.3 to 0.6 mg. per kilogram of body weight to monkeys induced a cataleptic state which lasted up to one

hour, during which time any surgical procedure could be performed without difficulty although all animals appeared to be awake and alert. The oral administration of somewhat larger doses of the drug to cats and dogs produced similarly satisfactory results. Doses in excess of those required for surgical anesthesia, however, tended to produce excitation and convulsions.

After adequate quantities of Sernyl were made available along with pharmacologic and clinical data, its applicability was investigated in three phases of surgical treatment: (1) preoperative sedation; (2) surgical anesthesia, and (3) postoperative analgesia.

The preoperative sedation effects were investigated in 42 patients from 20 to 73 years old. There was no evidence of respiratory depression, and the blood pressure remained either unaltered or slightly elevated. The pulse rate remained within normal limits. Sernyl premedication caused no obvious changes in patients' reactions to thiopental, atropine, halothane or succinylcholine. On recovery from anesthesia 29 patients had no recollection of their transfer to the operating table.

The surgical anesthesia effects were investigated in 67 patients from 18 to 90 years old. Sernyl was used as the sole anesthetic agent, from 10 to 20 mg. being injected intravenously. Within a few minutes the patients lapsed into either a catatonic stupor or a state of akinetic mutism and ceased to react to painful stimuli. The eyes remained widely open, staring fixedly into infinity with the conjunctival and pupillary reflexes unimpaired. The pharyngeal and laryngeal reflexes remained normal, and full muscle tonus persisted in the maxillofacial structures, resulting in unobstructed air passage and adequate jaw support. Sernyl is undoubtedly the most potent anesthetic agent as yet used in clinical practice.

The postoperative analgesic effects were investigated in 50 patients. Doses of 10 mg. Sernyl were administered intramuscularly at the conclusion of surgical interventions performed under halothane-oxygen anesthesia. The drug provided excellent relief from postoperative pain. Excitement appeared to be adequately suppressed by the previous administration of halothane-oxygen.

Sernyl appears to be a useful supplement to anesthesia in operations involving the maxillo-

facial region. The respiratory and cardiovascular reactions associated with the surgical stimulations during light anesthesia are eliminated by the drug, preferably administered intravenously after the induction of anesthesia with thiopental-halothane.

Royal Infirmary, Manchester, England

A method of blind nasal intubation for the conscious patient

Martin Irwin Gold and Donald Robert Buechel.
Anesth. & Analg. 39:257-263 May-June 1960

Blind nasotracheal intubation is the route of choice in the patient with maxillofacial injuries and a full stomach or with severe intra-abdominal hemorrhage. A technic is described for obtaining control of the airway, prior to induction of general anesthesia, by inserting a nasal tube "blindly" in the conscious patient. The technic requires three basic steps: (1) nasopharyngeal topical anesthesia, (2) translaryngeal topical anesthesia, and (3) blind nasal intubation.

A Macintosh nasal spray containing 4 cc. of 5 per cent cocaine is lubricated and inserted into the nostril through which the patient breathes more easily. As the spray is inserted deeper into the pharynx, the patient is told to inspire deeply, and the mist is sucked into the glottis. Adequate topical anesthesia from the nares to the epiglottis results.

Translaryngeal anesthesia is obtained with 2 cc. of 2 per cent lidocaine (1:100,000 epinephrine). The left index finger palpates the depression between the thyroid and cricoid cartilages. The patient is warned not to talk, cough or swallow. A no. 21 gauge needle attached to a 2 cc. syringe held in the right hand is inserted through the skin and cricothyroid membrane and into the lumen of the larynx. After aspiration of air to ensure correct placement, the injection is made and the needle rapidly withdrawn. As the patient coughs, the anesthetic agent is nebulized and the region from the carina to the epiglottis is sprayed topically.

The patient closes his eyes during the intubation. A thin-walled, cuffed endotracheal tube of appropriate size is lubricated. The patient is reassured and the anesthetist grasps the chin with

his left hand, occluding the unanesthetized nostril and lips. His right hand slowly but progressively moves the tube inferiorly and posteriorly, following the floor of the nose. The breath sounds are observed, and when the tube is in the pharynx, the patient is told to breathe deeply. If the tube is in the midline, it enters the larynx below an immobile epiglottis and between areflexic vocal cords. Since the gag reflex is obtunded, involuntary swallowing and subsequent closure of the glottis is prevented. The tube is taped securely and the cuff inflated.

Of the 50 intubations reported in this series, more than 50 per cent involved patients with maxillofacial injuries or who were scheduled for other orofacial surgical procedures. Intubation was successful in 48 of the 50 patients. Of the successful intubations, 38 (76 per cent) were considered easy, 7 were moderately difficult, and 3 were very difficult. Forty-five patients received successful intubations in less than five minutes, and 15 of the intubations were successful in the first attempt. The average time from intubation to induction was 18 minutes; from induction to incision, 17 minutes.

Postoperatively, each patient was followed up carefully. The intubation was traumatic in 4 patients; 4 patients volunteered the information that the intubation resulted in sore throat; when asked, 15 patients complained of sore throat; 4 patients complained of stuffy or "full" nose; 4 patients complained of painful nose, and 2 patients complained of tenderness in the cricothyroid space.

The procedure met with almost unanimous acceptance by the patients. The surgical staff had no adverse criticism. The technic is effective, easy to learn, simple and free of major morbidity.

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Suppression of pain by sound

Wallace J. Gardner, J. C. R. Licklider
and A. Z. Weisz. *Science* 132:32-33
July 1, 1960

In the senior author's dental office, suppression of pain by sound has been completely effective for 65 per cent of 1,000 patients who previously required nitrous oxide or a local anesthetic during comparable operations. For 25 per cent of the

patients, sound-induced analgesia was sufficiently effective and no other analgesic or anesthetic agent was required. For 10 per cent, sound-induced analgesia was less than adequate.

In the past year, audio analgesia equipment has been used by eight other dentists in the Boston area. Their experiences have paralleled those just summarized. In about 90 per cent of 5,000 operations, sound stimulation has been the only analgesic means required. More than 200 teeth were extracted under audio analgesia without encountering any difficulty or report of objectionable pain.

The procedure usually followed in inducing the analgesic condition involves the use of music and noise. The patient wears headphones and controls the stimuli through a small control box in his hand. Before the operation, and until a potentially painful procedure has to be employed, the patient listens to stereophonic music. As soon as he anticipates pain or feels incipient pain, he turns up the intensity of the noise stimulus. It is random noise with a spectrum shaped to provide a compromise between analgesic effectiveness and pleasantness of quality.

The main function of the music is to relax the patient. For most patients, the noise is the main agent that drowns out the pain.

The noise appears to suppress the pain caused by the dental operation. During cavity preparation, the noise also masks the sound of the dental drill, thereby removing a source of conditioned anxiety. The music promotes relaxation, and the noise (which sounds like a waterfall) also has a relaxing effect. When both music and noise are presented, the music can be followed only through concentration which diverts attention from the dental operation.

Patients enjoy having control over the massive acoustic stimulation. The procedure also provides a needed channel of communication between patient and the dentist; the dentist can judge the patient's state of anxiety or discomfort by noting whether the patient is using music or noise, and by observing the intensity level of the signal. Suggestion also plays a role, the significance of which has been difficult to estimate.

The pain-reducing effect of intense stimulation is not restricted to the auditory modality. The effect of vibratory stimulation has been observed by

Weitz (1942) and Wall (1959). Baruch and Fox recently demonstrated that a bright flash of light can inhibit the pain response to a localized electrodermal shock.

A possible explanation of the mechanism of audio anesthesia is the observation that parts of the auditory and pain systems come together in several regions of the reticular formation and lower thalamus. The interactions between the two systems are largely inhibitory. Perhaps acoustic stimulation decreases the "gain" of pain relays on which the branches of the auditory system impinge.

Exposure to intense acoustic stimulation must be controlled carefully in order to avoid the possibility of producing damage to hearing.

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Hyperventilation with oxygen: cause of cerebral hypoxia

K. Sugioka and D. A. Davis. *Anesthesiology*
21:135-143 March-April 1960

Several authors have reported that active or passive hyperventilation may result in a decreased blood flow. It seems possible, therefore, that this decreased blood flow might cause cerebral hypoxia even in the presence of an increased arterial oxygen saturation.

To explore this problem, the use of the oxygen electrode in studies on dogs was resorted to at the department of anesthesiology of the North Carolina Memorial Hospital in Chapel Hill, N.C.

Quantitative measurements of the cerebral oxygen pressure were performed in anesthetized dogs during spontaneous respiration and during hyperventilation.

The results were as follows:

1. A rise of about 50 per cent in the cerebral oxygen pressure was established after the inspiration of pure oxygen by the spontaneously breathing dogs.

2. A pronounced drop in the cerebral oxygen tension from a normal of from 8 to 15 mm. Hg. to 5 mm. Hg. resulted from hyperventilation whether attempted with room air or with pure (100 per cent) oxygen.

3. A close relation existed between the low

alveolar carbon dioxide content and the low cerebral oxygen pressure.

4. A rise in the cerebral oxygen tension occurred when carbon dioxide was added to the inspired inhalation anesthetic gases during hyperventilation and a fall to a low level when the carbon dioxide had been removed.

The conclusion could be drawn that cerebral hypoxia has been produced by hyperventilation in anesthetized dogs. In human subjects, therefore, the use of hyperventilation in anesthesia and resuscitation may be harmful.

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Clinical experience with Baytinal, a new short-acting barbiturate

Zora Antalovská. *Českoslov.stomat.* 60:42-46
Jan. 1960

Baytinal, sodium 5-allyl-5-(2'-methylpropyl)thiobarbiturate, a short-acting barbiturate designed for use in dental practice as an intravenous anesthetic, has definite advantages such as a lessened recovery time with more complete mental alertness after recovery.

In the dental office, the routine use of muscle relaxants as anesthetic adjuncts is not practical because the required controlled respiration is disadvantageous to the dentist. The high fat-solubility of Baytinal and the continuous administration of the drug during light-plane anesthesia help prevent rapid overdosing of the patient.

Clinical experience with Baytinal at the Dental Clinic of the University of Hradec Králové, Czechoslovakia, demonstrated that the drug is a safe anesthetic agent which can be used for all dental and oral surgical procedures when administered by an operator who has had a special knowledge and experience with barbiturates and a special training in their use. As clinical experience is gained with short-acting barbiturates in dental practice, the dentist will become more familiar with the advantages and disadvantages of these drugs. As no single antibiotic can be sufficient for all infections, no single anesthetic can be a panacea for all types of anesthesia.

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Extractions

The classification of dental forceps

Ian A. Findlay. *Brit.D.J.* 108:418-422
June 21, 1960

The first forceps specially adapted to the neck of a tooth was designed by Cyrus Fay in 1826, and developed by John Tomes in cooperation with the French instrument maker, Jean-Marie Evrard. Prior to this time, keys, pelicans, elevators, pincers and primitive forceps had been the instruments of the surgeon undertaking the removal of teeth.

Today the choice of instrument can be made from some 250 patterns of often similar pairs of forceps.

The present classification of forceps is based on numbers and names. The makers utilize the inventors' names and their own list numbers, which are related historically to the original construction patterns of the instruments. However, the numbers are no longer consecutive and the names often mean little to the student.

A dental forceps may be defined as a hand instrument designed to grasp a tooth as a double lever of the first class. There are two main types of forceps, upper and lower.

A further division of the upper and lower forceps types parallels the use of two basic principles in exodontics. In the first principle the forceps apply a cutting action by means of two rectangular blades which sever the gingival attachment, dilate the crestal portion of the socket and grasp the coronal third of the root of the tooth. These forceps may be used on all teeth but in particular on conical single-rooted forms, for which their blades are most suited. Such forceps are classified here as "cutting forceps."

In the second principle the forceps apply a pincer movement to the bifurcation of molars. This action is stabilized by the arrowhead or owl beak formation of the blades which fit into the

most coronal portion of the cleft between the roots, and obtain a slight lifting action through use of the alveolar crest as a fulcrum. These forceps may be used only on molars, and are classified here as "pinching forceps." Both types of forceps employ to a varying degree both principles of extraction, and their actions can best be described as "primarily" cutting and "primarily" pinching. Both types of forceps have blades which are transversely concave and designed to be adapted to the root of the tooth.

The mechanical advantage of forceps varies according to four separate functions of the instrument: (1) the wedge action of its blades in the displacement of the tooth; (2) its ability to act as a double lever, of the first class, to grip an object; (3) its power as a single unit lever, and (4) its wheel and axle motion for the bodily rotation of the tooth.

Although the ability to grip, lever and rotate provides a possible basis for classification according to mechanical advantage, such a system would give no indication of the shape and the size of the blade, which obviously are the important factors when choosing forceps. In a classification of forceps according to form, three main divisions arise: the handle, the joint and the blade.

Four main types of handles exist for upper and lower forceps:

1. Straight—standard upper straight forceps, Martins'.
2. Curved or shaped for access—Guy's, Balding's, Ladmores', Routuriers' and Strikas'.
3. Curved, combined with a comfort or safety factor—Read's (thenar eminence curve and little finger rest), Hill's, Thorne's, Steynor's (all with thumb rest), Ash 100 (with handle ends curved inward to contact before compression of the operator's thumb near the fulcrum).
4. Curved or straight, associated with wedges, screws, springs or ratchets fitted between the

FORCEPS FOR UPPER TEETH									
PRIMARILY CUTTING					PRIMARILY PINCHING				
STRAIGHT	SIMPLE	DUAL WIDTH	CROW	CLAW					
STRAIGHT BAYONET	SIMPLE								
ANGLED	SIMPLE	WISDOM	CROW	CLAW	OWL	OWLS. PARROT	OWL-CLAW	HORN-CLAW	HORN-CLAW PARROT
ANGLED BAYONET	SIMPLE	WISDOM		CLAW	OWL			HORN-CLAW	

FORCEPS FOR LOWER TEETH									
PRIMARILY CUTTING					PRIMARILY PINCHING				
RIGHT-ANGLED	SIMPLE AND DUAL WIDTH	SIMPLE PARROTS	CROW	CLAW	OWL	OWL-HORN	HORNS PARROTS AND HORNED	CLAW-OWL	OWL-CLAW PARROTS
ANGLED	SIMPLE AND DUAL WIDTH	SIMPLE PARROTS	CROW		OWL	OWLS. PARROT			
ANGLED (SAGITTAL)	SIMPLE		CROW	CLAW	OWL	OWLS. PARROT		HORNS	
ANG BAYONET (SAGITTAL)	SIMPLE				OWL				

A classification of dental forceps

handles to oppose the crushing action of the blades—Bell's, Baly's.

Two main types of joints are utilized in forceps:

1. Box joint, as in most lower forceps.
2. Screw joint, as in most upper forceps.

In 1746 Fauchard divided forceps into those with two blades of equal length (called *pincers*) and those with blades of unequal length (called *daviers*). Today the blades of British and American forceps commonly are of equal length, but in German patterns the *davier* persists.

Blades can be classified as to length and angle. In this classification, the bayonet forceps is defined as any forceps in which the blade is set on an arm some distance away from its joint. The relation of the bayonet blade to its handle may be parallel, angled or straight.

The proposed classification is shown in the illustration. The grading of the forceps is by blade length and width. For example, the inscription on a pair of Ash no. 1 upper straight cutting forceps would read 20/5, 20 being the blade length in millimeters and 5 the blade width in millimeters. Blade width is measured 2 mm. from its edge or at its widest point in owl-beaked forceps. If the blades are unequal in length, the notation of the buccal blade is placed first; for example, parrots 13-15/4; dual width 17/4-2. The bayonet forceps have the additional measurement of "reach" which is placed before the "effective" blade length; for example, 33/13-3-5.

These measurements would be inscribed on the outer surface of the end of the left handle in upper angled forceps, when held with their blades pointing outward and upward, that is, in the position of the pattern number in American forceps.

In lower forceps the blades are pointed downward and the inscription placed on the outer surface of the end of the lower handle.

The instrument maker's pattern number would continue to be used and would be inscribed on the inner surface of the right handle in upper forceps and the left handle in lower forceps, that is, in the same position at present used for recording this number in British forceps.

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Postoperative hemorrhage at the dental office

Zahnärztl. Rundschau 69:27 Jan. 8, 1960

Q.—The control of hemorrhages, whether occurring after tooth extractions or oral surgical interventions, is often difficult. Insertion of tampons made of cotton or sponge into the alveoli or surgical wounds not only causes discomfort to the patient but is often unsatisfactory. Is it advisable to use vasoconstrictors or thromboplastics preoperatively to prevent or reduce the incidence of hemorrhage at the dental office?

A.—The routine use of thromboplastic or vasoconstrictive agents at the dental office is contraindicated. Excessive hemorrhage after tooth extraction usually is associated with a prothrombin deficiency or a reactive hyperemia. At the dental office, the routine use of local anesthetics such as mepivacaine not containing vasoconstrictive agents will prevent postoperative hemorrhages. If in spite of this precaution a prolonged or copious hemorrhage should occur, immediate suturing and the application of bite-blocks (made of modeling compound or or self-curing acrylic resin) will control the bleeding.

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Histological and histochemical investigation of human alveolar socket healing in undisturbed extraction wounds

Melvin H. Amler, Percy L. Johnson and Irving Salman. *J.A.D.A.* 61:32-44 July 1960

A histologic and histochemical study of undisturbed alveolar socket healing, utilizing postextraction biopsies from normal human tissues at two to three day intervals over a period of 50 days, suggests the following sequence in the healing of an alveolar socket after exodontia:

1. Clot formation fills the entire alveolar socket and contains no metachromatic ground substance, glycoprotein or alkaline phosphatase.
2. Granulation tissue arises first at the periphery of the socket, accompanied by a metachromatic ground substance, glycoprotein and alkaline phosphatase, two to three days after

tooth extraction. The granulation tissue invades the centrally positioned blood clot and replaces it completely by the seventh day.

3. Newly formed connective tissue is found at the periphery on the fourth day, with an increase of metachromatic ground substance, alkaline phosphatase and glycoprotein framework. The new tissue encroaches on the granulation tissue progressively and replaces it by the twentieth day. This occurs in much the same manner as that by which granulation tissue had previously replaced the blood clot.

4. As to bone formation, by the seventh day osteoid is evident at the base of the socket in a high metachromatic ground substance bounded by osteoblasts laden with large amounts of alkaline phosphatase in the cytoplasm. An integral part of this complex is glycoprotein associated with the development of osteogenic fibers. Newly regenerated spicules attach directly to the old bone. Mineralization occurs and trabeculae are formed gradually, filling at least two thirds of the

socket fundus by the thirty-eighth day. Roentgenographic studies indicate visible changes in the socket at about the eighteenth day. Definition of the lamina dura is lost about the thirty-eighth day. The radiopacity increases until a peak is reached at about 100 days, when the socket content is nearly identical in density to the surrounding alveolar process.

5. Epithelialization is evident at the fourth day and is associated with glycogen and glycoprotein. Alkaline phosphatase underlies the epithelium. Fusion was noted in some specimens at 24 days, although in certain specimens fusion had not yet taken place by the thirty-fifth day.

Normal factors influencing the time for complete epithelialization include diameter of the socket, age of patient, laceration of the gingiva, height of the alveolar crest, and foreign bodies in the socket. Influential pathological factors include periodontal condition (preoperative), local infection (postoperative), and nutritional and systemic factors, such as organic disease.

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Prosthetic dentistry

Deepening of the whole floor of the mouth for satisfactory prosthetic treatment: A combined submucosal plastic operation

Ingmar Virtanen. *Suomen hammaslääk.toim.* 56:115-129 June 1960 [in English]

Atrophy of the alveolar ridge of an edentulous mandible is likely to be the most common obstacle, and the one most difficult to overcome, in prosthetic treatment of the lower jaw. A surgical method designated for patients for whom an appropriate denture cannot be constructed because of atrophy of the alveolar ridge has yielded good results in six patients.

The method involves a combined submucosal lingual and buccal alveoplasty for deepening of the whole floor of the mouth. On the buccal side the method of Obwegeser (1953) is used. On the lingual side, the method of Trauner (1952) for detaching the mylohyoid muscle from the mandible and the method of detaching the genioglossus presented by Wassmund (1931) are combined. However, the detachment of these muscles is achieved without long horizontal incisions of the mucosa. The result of the closed plastic operation is not imperiled. The technic of suturation permits the use of the wide freed areas of the lower jaw as a denture-bearing surface. The denture is supplied with wide lingual wings corresponding to the freed posterior parts of the inner surfaces of the jaw, which are capable of securing its retention.

On the buccal side, vertical incisions of about 1 cm. are made on both sides immediately behind the mental foramen. At the foramen the mental nerve is exposed through the incision in order to protect it against injury in later stages of the operation by observing it visually. The detachment is done with a narrow, blunt elevator, one end of which is bent to make an angle of 150 degrees. This instrument is carried posteriorly through the incisions beneath the mucosa. The

mucosa is detached from the underlying layer so that the posterior point of the buccinator muscle also becomes detached. Similarly, the loose submucous tissue is detached carefully from the periosteum without injuring it. The detachment is carried out down to the level of the inferior border of the mandible. Likewise, the instrument is carried through the incisions anteriorly beneath the mucous membrane. The labial mucosa of the mentum and the mental muscle, as well as the submucosal tissue, are detached from the periosteum.

Two short vertical incisions also are made on the lingual side at the cupid region, that is, somewhat more anteriorly than the buccal incisions. Through the lingual incisions the mucous membrane is first detached from the underlying tissue and the mylohyoid muscle from the mylohyoid line. The afore-mentioned elevator is used. The detachment of the muscle is surprisingly easy, and it can be assured through palpation of the mylohyoid line through the mouth. After the detachment the mylohyoid line is felt as a free crest. When the loose connective tissue beneath the muscle has been pushed downward, the inferior border of the mandible can be felt through the incision with the instrument, and it can be ascertained through the mouth that the mucosa sinks down freely.

Two orlon sutures are carried with a hernia needle medially between the mentum and the sublingual papilla to fix the genioglossus to the underlying geniohyoid muscles. During suturation the needle is felt through the skin under the jaw. The upper part of the genioglossus muscle now is detached from the bone so the inner surface of the mentum is partly freed. Such a detachment is not continued far, not down to the inferior border of the mandible. The first stage of the operation is shown schematically in Figure 1.

In the suturation stage of the operation, the detached parts of the mucosa are pushed deep down to the floor of the mouth and the vestibule and kept there by sutures until they have been fixed to the new positions through cicatrization. A Reverdin's needle, shown in Figure 2, is carried through the skin at the inferior border of the mandible along its buccal surface. The eye of the needle is closed and no suture is used at this time. The bent point is toward the chin and perforates

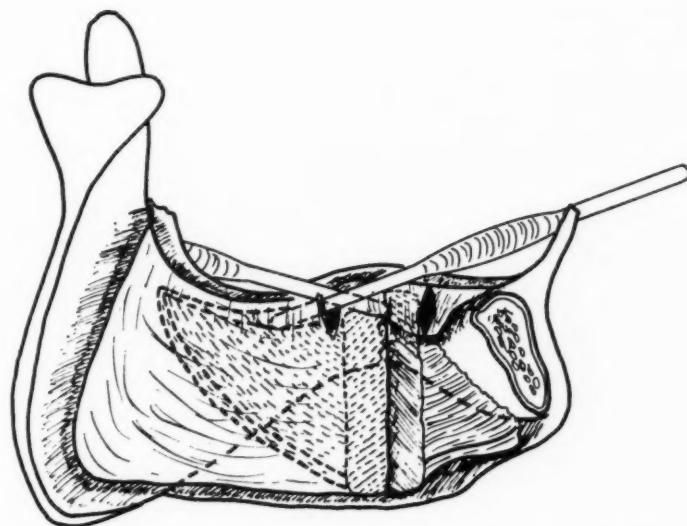
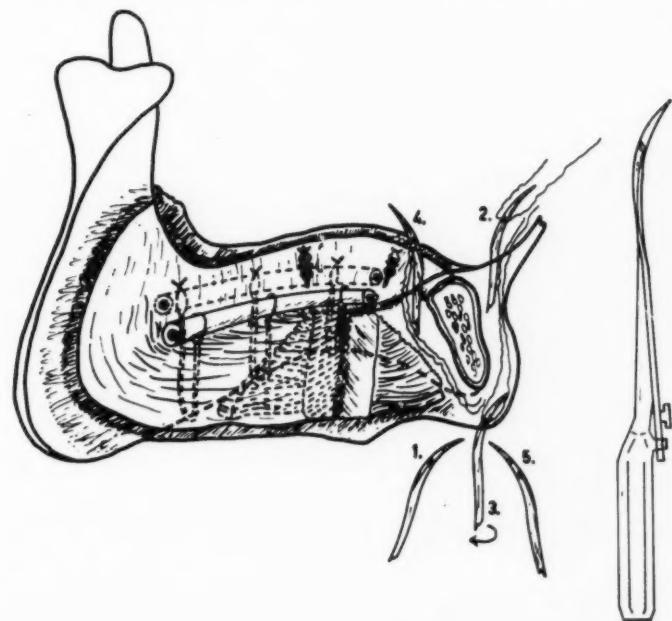


Figure 1 Removing of mylohyoid and genioglossus muscles through two small vertical incisions

Figure 2 Right: Leading the wire sutures from buccal fold to the lingual surface with a Reverdin's needle (far right). Left: Both rubber tubes in position, deepening the floor of the mouth and the buccal fold by tightened sutures



the detached mucosa of the vestibule. The eye of the needle is opened with the slide. A thin, twined wire is placed in the needle with both ends of the wire equal in length. The needle eye is closed and the needle is drawn back down to the level of the inferior border of the mandible. The point of the needle is turned on to the lingual surface of the bone, but the needle is not drawn through the skin. In this manner the needle and wire are passed through the detached lingual mucosa to the lateral side of the sublingual duct; the needle eye is opened and the wire removed. The needle, with its eye closed, is then drawn out through the place where it pierced the skin.

The twofold wire suture now passes from the vestibule beneath the mandible to the lingual mucosa; its loop is on the lingual side and both of the free ends are on the buccal side. Two sutures are made on each side of the jaw, and one in the middle line. Thereafter, all of the incisions are closed with superficial interrupted sutures. The saturation stage is shown schematically in Figure 2.

The third and last stage of the operation consists of the fixation of the detached lingual and buccal mucous membranes to as low a level as possible with the wire sutures. A rubber tube measuring 4 mm. in diameter is drawn through the lingual loops. It extends about 2 cm. backward from the distal suture. Another rubber tube is placed between the buccal ends of each wire suture. Then each suture is tightened separately and tied around the buccal tube. The final stage of the operation is also shown schematically in Figure 2.

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Allergic reactions to steel prostheses

Giorgio Re. *Minerva stomat.* 9:53-56
Jan. 1960

During 1959, nine patients exhibiting hypersensitivity to inserted bridges, crowns or dentures made of or containing stainless steel were observed at the Dental Institute of the University of Turin, Italy.

The allergic manifestations were discoloration of the oral mucosa, edema and eczema. The aller-

gen was demonstrated either by external skin tests or by cutaneous reactions induced by intracutaneous injections of a solution containing 1:1,000,000 of the suspected sensitogen (chromium, cobalt, copper, nickel and steel) and an iontophoretic agent. In all nine patients, a definite hypersensitive condition was determined by exposure and re-exposure to steel.

In one patient, a 39 year old woman, two lower molars had stainless steel crowns. The obviously allergic reaction consisted of a severe inflammation involving not only the adjacent mucosal region but the inner cheek. In this patient, an almost identical allergic reaction to any synthetic polymerized acrylic resin (such as used in the manufacturing of nylon stockings) has been observed.

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A relining technique for mandibular dentures

Robert R. Gillis. *J.Pros.Den.* 10:405-410
May-June 1960

The described technic for relining dentures applies particularly to the patient whose mandibular ridge has been shortened 2 mm. or more and in whom the resulting malocclusion is such that both the centric relation and centric occlusion are lost. With the technic, from 2 to 14 mm. of lost vertical dimension can be restored in a single procedure. The muscles of the face and neck are permitted to dictate maxillomandibular relations.

The vertical dimension of occlusion is determined after ascertaining the vertical dimension of rest position by the use of functions employing all of the muscles of the face and neck. After the vertical dimension of rest position has been determined and recorded, the resulting interocclusal distance is established. Softened modeling compound is luted to the occlusal surfaces of the mandibular bicuspids and molars, and resoftened in hot water. The dentures are placed in the mouth and the patient is directed to say m-m-m-m. The cusp forms of the upper artificial teeth will register in the soft modeling compound. (The upper denture can be stabilized with adhesive powder.) The resulting record is removed from the mouth, chilled, and any excess modeling

compound is removed, leaving only the impression of the cusps. The mandibular movement made in saying m-m-m-m registers a closure from the vertical dimension of rest position, but this movement does not establish the vertical dimension of occlusion.

The modeling compound is heated again, the dentures are reseated in the mouth, and the patient is instructed to "smile, grin, grin hard and swallow; hold this and keep on grinning." The action of grinning retracts the mandible to centric relation, and swallowing produces a closing movement which stops at the vertical dimension of occlusion. The excess modeling compound is removed and, if necessary, the grin-swallow procedure is repeated. The vertical dimension of occlusion usually measures about 3.5 mm. shorter than the vertical dimension of rest position. The grin-swallow procedure is repeated with the modeling compound hardened to determine if the cusps interdigitate correctly in the compound when the patient swallows.

A lower wash impression is prepared in the old denture base. The denture containing the impression material is placed in the mouth and the grin-swallow routine is repeated. The upper cusps again reseat into the indentations. While the impression material is still workable, the patient is instructed to continue to grin, pout and swallow, thereby maintaining occlusion. The border is molded for a functional, closed-mouth impression.

A cast is poured in the lower impression and in the upper denture. The two dentures are mounted on an articulator that has an incisal pin to maintain the established vertical dimension of occlusion. The thickness of the modeling com-

pound in the region of the molars and bicuspids indicates the amount of vertical dimension that has been lost since the dentures first were constructed.

The modeling compound is removed from the lower teeth. The space between the upper and lower teeth also is evidence of the amount of ridge resorption.

The lower denture is removed from the cast, and the lower cast is loosely covered with tin foil. The lower denture is placed in occlusal relationship with the upper denture, as indicated by the intercuspal position of molars and bicuspids. This position restores the original occlusion in the dentures. The flanges of the denture may require some shortening to permit the articulator to close at the desired position. The vertical space demonstrated interocclusally now lies between the lower denture and the lower cast. Softened modeling compound is added to the lower cast covered with tin foil, and the lower denture is forced into the compound as the articulator is closed to its fixed position.

After the modeling compound has been chilled, the lower denture together with the compound and tin foil are lifted from the cast. The excess modeling compound is trimmed away, and the final wash impression is taken in the patient's mouth as the grin-swallow procedure is continued. The cast is poured and the denture is processed.

This relining technic is not applicable to dentures with plastic teeth which have become grossly abraded. This technic cannot correct faulty occlusion or other errors or omissions inherent in the original construction.

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Pathology

The pathology of carious human dentine

M. Jolly and H. R. Sullivan. *Austral.D.J.*
5:157-164 June 1960

The progression of a carious lesion through dentin once was thought to be a simple process involving the destruction of an inert organic material impregnated with inorganic salts. It is now recognized that the environment is inconstant and complex and that certain components of the dentin are metabolically active, allowing the possibility of great variation in the resulting picture of destruction. The individuality of each carious process, reflecting as it does the particular set of intrinsic and extrinsic factors present at any particular time, is beginning to be recognized.

To demonstrate some factors which are inconstant in their occurrence and magnitude within the dentinal lesion, undecalcified and decalcified serial section of carious lesions in freshly extracted human teeth were examined by various means.

The following observations were made:

1. Decalcification was a constant and initial factor.
2. Proteolysis appeared to be present only occasionally and then in a variable degree.
3. The pH range of lesions always was between 4.0 and 5.5.
4. Each lesion had its own individual appearance.
5. The number of intratubular particles recognizable as microorganisms was not great enough for such microorganisms to be regarded as the prime causative factor in the lesion.

It is generally accepted that, as a carious lesion progresses through enamel to dentin, there is a lateral spreading at the dentinoenamel junction. The present observations were in agreement with this.

The authors suggest that dentinal lesions are

produced by an initial acid decalcification of the dentinal matrix after which there may be a proteolytic attack on the collagenous fraction which may vary greatly in its intensity. This probably is accompanied by depolymerization of the ground substance. The changes of the dentin develop on a broad, somewhat hemispherical front; the gross bacterial factors are concentrated superficially. Each lesion develops its own individual appearance, depending on a multiplicity of factors but particularly on the ability of the pulpal tissues to bring about reactions within the tubules.

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The development of cleft palate resulting from maternal pteroylglutamic (folic) acid deficiency during the latter half of gestation in rats

C. W. Asling, M. M. Nelson, H. D. Dougherty, H. V. Wright and H. M. Evans. *Surg.Gyn.& Obst.* 111:19-28 July 1960

The development of cleft palate resulting from maternal deficiency of pteroylglutamic (folic) acid during the latter part of gestation was studied and compared with normal palatal development in rats of the Long-Evans strain.

Normal rats were transferred on the tenth, eleventh, twelfth or thirteenth day of pregnancy to a diet deficient in pteroylglutamic (PGA) acid, but containing succinylsulfathiazole and a crude PGA-antagonist. Control rats were maintained either on a stock diet consisting of natural food sources in optimal proportions, or on a purified diet containing succinylsulfathiazole and a high level of the vitamin PGA. The young were obtained on the twenty-first day of gestation, 12 to 24 hours before anticipated parturition.

To follow the stages of normal and abnormal development, some of the young were obtained at one-day intervals from the thirteenth to the twenty-first day from pregnant rats given the PGA-deficient or control diet from the eleventh day of gestation. Some control young were obtained at half day intervals during the same period.

When the deficiency was instituted on the tenth day of gestation, 100 per cent of the young had

cleft palate at term. The percentages for the succeeding days were as follows: eleventh day, 95 per cent; twelfth day, 2 per cent, and thirteenth day, 0 per cent.

Studies on the normal development of the palate in rats show that the lateral palatine processes maintain a ventromedial direction under the lateral margins of the tongue until the sixteenth day. Thereafter the tongue lies lower in the mouth and the lateral palatine processes move into a horizontal position, establish contact with the median nasal process, and fuse to form the oral roof. In fetuses from PGA-deficient mothers the tongue was high in the mouth until the eighteenth day, with the lateral palatine processes maintaining their position under its margin. Thereafter a palatal cleft persisted, though the tongue descended.

Micrognathia, in varying degree, frequently was an accompanying deformity in the test young. Development of the lower jaw in PGA-deficient fetuses was retarded from the fourteenth or fifteenth day of gestation. In the sequence of conditions encountered in this experiment, it could be held that the small size and abnormal shape of the mandible were responsible for the failure of the tongue to descend and to permit the normal position and fusion of the lateral palatine processes.

A subsequent report will describe the more bizarre and varied palatal, labial, nasal and maxillofacial malformations encountered when a transitory PGA deficiency of two to three days was induced earlier in pregnancy.

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Incidence of supernumerary teeth

Christian Schulze. *Stoma* 13:128-140 May 1960

The more general use of roentgenography in dental practice, especially with the increasing tendency to take complete dental roentgenograms as part of an oral examination, permits an accurate determination of the incidence of supernumerary teeth in man.

Only by observation of a large series of dental patients from the time the deciduous dentition is completed to the time the last tooth of the permanent dentition has become fully calcified can the frequency of supernumerary teeth be evaluated.

The data on which the present study is based were obtained from the observation of 48,550 adult patients (with an average age of 40 years) examined at the Dental Clinic of the University of Göttingen, Germany. Roentgenographic examinations revealed that supernumerary teeth were present in 441 patients, that is in 1 of 110 persons. Because supernumerary teeth occur in otherwise healthy persons who do not undergo dental examinations, the true incidence is at least 10 in 1,000.

In the present series, there were 446 supernumerary teeth in the upper jaw but only 54 in the lower jaw; a ratio of 8.2 to 1. Considering the far higher incidence of maxillary supernumerary teeth, this phenomenon can not be considered atavistic. The incidence of supernumerary teeth, far higher than previous estimates have indicated, seems to suggest the conclusion that most tooth types, especially the upper teeth, have a genetic tendency to duplicate, possibly by hyperproductivity of the tooth germs.

Clinically and anatomically, three types of supernumerary teeth can be distinguished:

1. Those developing secondarily to the already erupted permanent molars. This type is often considered a part of a "third" dentition.
2. Those originating from the dental lamina system that normally cannot produce teeth. This type is characterized by abnormal root formation.
3. Those resulting from abnormally positioned tooth germs, usually erupting in a wrong direction adjacent to normally erupted teeth. This type usually consists of duplicated third molars (the normal third molars remain impacted), erupting in the bifurcation of the second molars.

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Medical and dental complications of an abnormally long styloid process

I. Kaiser-Meinhardt and E. Seitz.

Mschr.Ohrenhk. 93:302-308 April 1960

Five case reports are presented describing the symptoms arising from an abnormal styloid process extending downward from the lower surface of the temporal bone. The main complaints of the patients were glossopharyngeal neuralgia, dysphagia of undetermined cause, stabbing pain in

the region of the ear and the mouth (otalgia dentalis), and a feeling of tightness in the neck.

In all five patients, the symptoms disappeared after surgical removal of the styloid process.

For the differential diagnosis, impacted third molars (or retarded tooth eruption), inflammatory processes in the tongue, pharynx or larynx, and early carcinoma of the oral cavity, the pharynx or the hypopharynx should be considered.

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Roentgenographic investigations of arthropathies of the temporomandibular joint

G. Cimasoni. *Rev. mens. suisse odont.* 70:428-455 May 1960

Thirty patients (23 women and 7 men) with disturbances of the temporomandibular joint were examined recently at the Institute of Medical Dentistry of the University of Geneva, Switzerland.

Although conclusions can hardly be drawn from such a relatively small series, it seems that disturbances of the temporomandibular joint occur far more frequently in women than in men. Because these disturbances seem to be associated with specific deviations from the normal centric (intermaxillary) occlusion, it appears important to establish whether these anatomic abnormalities, such as mandibular overclosure or displacement, are sex-linked features occurring more frequently in women than in men.

The peak of incidence of temporomandibular joint disturbances seems to lie at an age between 25 and 35 years, recurring at an age between 50 and 60 years.

In this series, 22 of the 30 patients exhibited some of the symptoms of Costen's syndrome but not in syndromic form. These symptoms were cephalgia or neuralgia in the region of the nerves of the brain, extreme pain sensations in the nasopharyngeal area, glossalgia and glossodynia, difficulties in mastication and in movements of the joint and dizziness. Other specific symptoms of Costen's disease such as impairment in hearing, unilateral atrophy of the soft palate

and decrease in salivation were absent in all 30 patients.

Customary roentgenographic examinations, however, produced inconsistent and, sometimes, misleading results. The roentgenograms seemed to indicate the presence of specific anatomic defects of the joint, which could not be verified by either clinical examination or tomography (body section roentgenography).

Appropriate orthodontic and prosthodontic procedures caused the symptoms to disappear completely.

Only in three patients could an association be established between the disturbances of the joint and arthrosis, possibly caused by rheumatism.

In two patients, similar joint disturbances were found in other members of their families. A certain hereditary disposition to disturbances of the temporomandibular joint, therefore, cannot be excluded.

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Relations between gynecologic and oral diseases

E. Maurizio. *Panminerva med.* 2:177-179 April 1960

The important relations between diseases occurring in the female genital tract and those appearing in the oral cavity have been demonstrated by investigations carried out at the Obstetric and Gynecologic Clinics of the University of Genoa, Italy.

Pathologic manifestations in the female genital system often are associated with specific symptoms occurring in the oral cavity. The soft oral tissues seem to be extremely sensitive to any change in the hormone metabolism. Examinations of oral and vaginal smears have revealed the presence of changes in the crystallization of the saliva as well as forming the fern-leaf crystallization pattern in the cervical mucus during the menstrual cycle. Both phenomena obviously are related to a single common denominator represented by the secretion of sex hormones.

The so-called "puberty gingivitis" is caused by an inflammatory process mainly affecting the gingiva. This periodontal disease is characterized by gingival hypertrophy, hemorrhage and hyper-

plastic growth. The symptoms often disappear spontaneously after the patient has passed her puberal period.

Another form of periodontal disease, the so-called "early alveolar atrophy," has often been observed in patients at the onset of the puberal period. It is characterized by histologic, clinical and roentgenographic pictures resembling those of "senile physiologic alveolar atrophy."

Among the oral and dental diseases occurring during puberty, periodontosis is the most frequent symptomatic process. The teeth, especially the molars, become suddenly loose because of absorption of the alveolar process and a gingival inflammation resulting in formation of purulent pockets. During puberty, caries appears to be increasing significantly, affecting several teeth simultaneously. These pathologic manifestations appearing in the periodontal tissues of girls during puberty provide sufficient evidence for an existing relationship between dental or oral diseases and endocrine, metabolic and psychic disturbances.

Abnormal retention of deciduous teeth has often been observed in adolescent patients affected with hyperovaria, hyperthyroidism and a consequently delayed development of the reproductive organs.

Hypertrophic gingivitis with a tendency to hemorrhage has often been observed in patients with amenorrhea. This periodontal disease seems to be related to a cyclic variation of the hormone secretion and represents specific oral and gynecologic symptoms. The interference of ovarian hormones with the metabolic processes during the menstrual cycle causes the development of the so-called "menstrual gingivitis."

Among the gingival tumors occurring during pregnancy, epulis is most often encountered, appearing in the form of a usually benign lesion of the periodontium.

Toward the end of gestation or during the initial breast feeding, many young mothers complain of an increase in the incidence of primary caries or the occurrence of carious lesions due to secondary caries. The old saying that every pregnancy costs the mother a tooth may carry a grain of truth. Unquestionably, the incidence of caries increases significantly during pregnancy.

The clinical picture of patients with toxemia of

pregnancy reveals both an extensive involvement of the periodontium and the occurrence of specific pathologic symptoms in the genital tracts. Similar symptoms, however, are often observed during normal pregnancy.

Cooperation between dentists and gynecologists may provide further knowledge of the relations existing between oral (dental) and gynecologic diseases.

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Unusual manifestations of cheilitis granulomatosa

O. Hornstein. *Deut.med.Wschr.* 85:430-433
March 11, 1960 and *German M.Monthly*
5:157-161 May 1960

There are certain clinical pictures which have become nosological entities although their etiology is still obscure or disputed. A well-known example is sarcoid of Boeck which O. Fresen (1958) called the second important granulomatous disease, the first being tuberculosis.

A much less known clinical entity is cheilitis granulomatosa (Melkersson-Rosenthal syndrome) frequently associated with recurrent swelling of the lips and facial paralysis. Thirty-two years have elapsed since E. Melkersson's description, and 29 years since C. Rosenthal's observations verifying Melkersson's report, but the inflammatory cause of the syndrome was not recognized until histologic studies of the affected lips were undertaken by W. Gahlen and B. Brückner in 1951. Since then the Melkersson-Rosenthal syndrome has received increasing attention, especially from dermatologists and dentists. It was established that the originally described triad of symptoms (Rosenthal had added that of a fissured tongue) was present only in a small proportion of patients. Recurrent macrocheilia and persistent macrocheilia are the most common symptoms. Edemas were found isolated or in combinations on the facial skin, the oral mucosa, lips, tongue, cheeks and in other areas of the oral cavity even as deep down as to the epiglottis.

Neurologic manifestations occurred in various fashions; sometimes they were absent, at other times they involved the peripheral nervous system or the central nervous system.

The association of these varying symptoms with the Melkersson-Rosenthal syndrome was based mainly on the characteristic histologic picture. The same type of inflammation was revealed as seen in tuberculoid granuloma, a lymphocyte-plasma cell variety surrounded by edema. The color and consistency of the swelling, the combination with neurologic manifestations, the sudden onset of edematous attacks that lasted for several days during which the patient usually remained afebrile and without serious complaints, are clinical features which despite their diversity constitute a characteristic picture.

During the last ten years, 60 patients with this syndrome have been observed at the Dermatological Clinic of the University of Bonn, Germany. The atypical manifestations of the syndrome in these patients, that is those which do not correspond to the narrow triad as originally defined, present considerable diagnostic difficulties, aggravated by the lack of knowledge about the syndrome's etiology. However, the almost pathognomonic features of the periodic facial and oral swellings, the specific histologic picture and the typical patient's history showed that the various "marginal" manifestations are in fact integral parts of the symptom complex of cheilitis granulomatosa, even though such manifestations may lie beyond the topographic boundaries of the classic triad.

Three case reports are presented, describing unusual manifestations of the syndrome. There were persistent macroglossia (initially diagnosed as granulomatous glossitis), isolated swellings of the eyelids (erroneously diagnosed as granulomatous blepharitis) and inflammatory involvement of the larynx (mistaken for granulomatous laryngitis). The association of involvement of the respiratory tract, the larynx and the ophthalmic region with the classic triad of the Melkersson-Rosenthal syndrome has not been previously reported in the literature.

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Barotrauma

C. D. Moslener. *Zahnärztl. Praxis* 11:138
June 15, 1960

The phenomenon of barotrauma, that is, injuries to human tissues caused by the difference between internal and external pressure, has been observed frequently in aviators. The same symptom complex occurs in deep-sea divers and frogmen.

Even a comparatively small pressure difference (50 mm. Hg.) can lead to repletion and inflammation of the capillaries and to formation of edemas, whereas an increased pressure difference (250 mm. Hg.), often experienced by deep-sea divers and frogmen, causes severe capillary hemorrhage.

In deep-sea divers and frogmen, barotrauma is characterized by injuries to the cartilaginous walls of the eustachian tube, the lungs, shoulders, eyes, sinuses and oral tissues, especially the mucous membrane and the dental pulp. Injuries to the maxillary sinuses and to recently filled teeth with vital pulps result in fulgurant pain. The pressure experienced is sometimes strong enough to tear out fillings, inlays, crowns and fixed bridges.

Drugs are of limited value in the treatment and prevention of barotrauma, but in isolated instances large doses of vitamin B₁ or B₂ appear to produce beneficial effects. Prolonged hemorrhage in the oral cavity associated with barotrauma may be controlled sufficiently by the application of a dressing moistened with a 1 per cent solution of phenylephrine.

None of the dental and medical treatment methods suggested by various authors represents the final answer to prevention of barotrauma in aviators and deep-sea divers.

Complete dental and oral examinations followed by the treatment indicated are prerequisites before high-altitude flying or deep-sea diving can be permitted.

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Cancer diagnosis for the general practitioner

L. Eckmann. *CIBA Symp.* 7:270-274 Feb. 1960

In almost all countries of the world, a frightening increase in the incidence of carcinoma of the oral cavity and the upper respiratory tract has been observed. Twenty-five years ago this type of cancer occurred once in every 15 instances of malignancy, whereas today it is responsible for one instance in every five. In men, it is the most common form of cancer. In women, however, the incidence is about seven times smaller, but it is gradually increasing.

Squamous cell carcinoma is encountered almost exclusively in heavy cigarette smokers, and this phenomenon has led to an association of cause and effect. Chronic bronchitis caused by heavy smoking may facilitate cancer formation even after several years have elapsed. Although squamous cell carcinoma can be justly regarded as the smoker's form of cancer, it only accounts for about one half of the total number of instances of oral and bronchial cancers. There exist almost as many undifferentiated small cell carcinomas, and about 10 per cent of these malignant tumors are adenocarcinomas, for which smoking cannot be made responsible.

In taking the patient's history, special attention should be paid to the early symptoms such as chronic cough, mild dyspnea (even during rest), increased salivation (especially in smokers) and expectoration of blood. Other suspicious signs are obstinate catarrh and recurrent pulmonary infiltration. The patients seldom complain of pain. Extreme hoarseness indicates an involvement of the recurrent laryngeal nerve.

The methods of investigation required if these symptoms are mentioned should begin with a thorough roentgenographic examination of the involved and the adjacent regions. Roentgeno-

graphic examination, however, is often insufficient because comparatively small tumors may be hidden beneath perfectly healthy tissues. In an effort to diagnose the presence of a malignant tumor of the oral cavity or the upper respiratory tract at an early stage before complications set in, the usual roentgenograms should be supplemented by lateral exposures with hard roentgen rays. This will facilitate the differentiation of normal and pathologic shadows and help in detection of signs of translucency, erosion or displacement of respiratory passages. In all instances in which suspicious findings are made, the use of tomography is indicated. Suspect tissues should be examined by means of biopsy. A method producing positive findings in a far higher proportion than biopsy is that of cytologic examination.

It is seldom possible for a dentist or physician, whether he is a general practitioner or a specialist, to carry out all the investigations necessary to diagnose the presence of a malignant tumor at an early stage. As a rule, therefore, the patient should be referred to a large hospital. The general practitioner, however, can supervise the investigation program he considers necessary, provided he keeps in close touch with the various specialists furnishing the diagnostic aids. It is, of course, of specific significance not to overlook any symptom pointing to possible malignant cancer during the first examination. The patient's expectation of life lies, in the vast majority of instances, in the hands of the general practitioner whether he is a dentist or a physician.

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Senescence and hormonal factors in the development of cancer

G. C. Dogliotti. *Panminerva med.* 2:110-114
March 1960

Malignant tumors are most frequently found in middle-aged or senescent patients. However, the reason for the increased incidence in these age groups is not fully understood. Many cancer researchers maintain that malignant tumors occur more frequently in presenile patients whereas the incidence decreases significantly in senescent patients.

The statistical data of the incidence of malignant tumors occurring in the various age groups, based on the morbidity and mortality figures published in almost all advanced countries of the world during recent years, were reviewed and compared at the Medical Clinic of the University of Turin, Italy.

The results may be summarized as follows:

1. The absolute incidence of malignant tumors (approximate values) in the various age groups is represented by a bell-shaped curve which reaches its maximum between the ages of 40 and 65 years.
2. The relative incidence of malignant tumors estimated on the basis of observations of survivors in the various groups (standardized values) is represented by a steadily ascending curve which reaches its maximum at an advanced age.
3. The behavior of carcinoma and sarcoma appears to be almost identical even if sarcoma occurs relatively more frequently in younger patients than does carcinoma. The same finding applies to malignant tumors of the oral or the hemolymphopoietic region.
4. The chances of contracting cancer during infancy and childhood are low, but increase progressively with the passing of time, reaching the maximum during senescence.
5. Malignant tumors behave differently according to their types and sites.
6. Malignant tumors increase in frequency with age only because the senescent patient has contacted more carcinogenic factors and remains exposed to them for a longer period of time.
7. Carcinogenic factors (chemical, traumatic, toxic, infectious, and so forth) influence the development of malignant tumors during two different stages: a preliminary and an activating period.
8. In contrast to previously published statistics, the incidence of cancer in patients over 90 years old is extremely high. In the few post-mortem reports on oral cancer published, various malignant tumors and precancerous lesions were found which did not show any symptom during life. These lesions (senile warts, hyperkeratosis, verrucae seborrhoeica, atrophy, polyposis, and so forth) represent local manifestations of decay associated with the process of growing old.
9. Neoplastic stimuli in older people consist in a storage of incompletely developed metabolic

substances (especially steroid metabolites) in the tissues.

10. Many theories on the etiology of cancer emphasizing the role senile changes and hormonal factors play in the development of malignant tumors have been confirmed clinically. The incidence of cancer in hyperthyroid patients, for instance, is comparatively low. The few exceptions observed (occurring mainly in older women) can be easily explained by the hormonal disturbances during and after the menopause which induce a condition similar to that of hyperthyroidism.

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Lymphangioma of the tongue

Erik Hansen. *Tandlaegebl.* 64:359-365
June 1960

In the oral cavity, lymphangioma occurs principally in the tongue, although it is sometimes observed in other oral regions.

The benign tumors appear either as multiple nodules or as diffuse enlargements, and are probably congenital. Larger tumors may become ulcerated and cause extreme pain. Intermittent drainage may result from rupture of some of the larger channels. Frequently there occurs a considerable keratotic activity, producing a roughened, whitish, scaly surface with an occasional formation of vesicles.

Lesions occurring at the dorsum of the tongue are usually unilateral, although they may extend, in mushroom fashion, to the opposite side of the tongue, giving the appearance of involving the entire tongue.

Two types of lymphangioma of the tongue can be distinguished clinically and histologically: lymphangioma simplex and lymphangioma difusum. In lymphangioma simplex, no swelling of the tongue occurs, whereas in lymphangioma difusum the clinical symptoms resemble those of macroglossia. Histologically, the difference between both types can be observed in the number and size of the cavities lined with endothelial tissue. Lymphangioma simplex does not exhibit many lymph cavities. The cavities are small and delicately lined lymph spaces connected with each

other and containing varying amounts of a clear-colored material. Lymphangioma diffusum shows a far greater number of these lymph cavities, profoundly increased in size.

Both types of lymphangioma are amenable to excision, with either the scalpel or the endothermic knife. Immediate ligation of the larger vessels during surgical elimination of the tumor may be indicated to prevent excessive hemorrhage. Roentgenotherapy and the application of sclerosing solution are of value, especially in instances of larger tumors. Lymphangiomas which are nodular and attached to the tongue by a broad pedicle can be removed by a simple surgical excision because the lymph channels usually are superficially positioned, in contrast to hemangioma, where they extend to involve adjacent tissues.

Four case reports of lymphangioma of the tongue are presented, three of lymphangioma diffusum and one of lymphangioma simplex.

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Oral smears in the diagnosis of carcinoma and premalignant lesions

W. O. Umiker, I. Lampe, R. Rapp and J. J. Hiniker. *Oral Surg., Oral Med. & Oral Path.* 13:897-907 Aug. 1960

This investigation was undertaken to determine the accuracy of cytopathology in the diagnosis of untreated, residual and recurrent carcinomas of the oral cavity and oropharynx, and to ascertain the potential diagnostic capabilities of oral smears in the differentiation of benign mucosal lesions from premalignant and early malignant lesions.

The first series consisted of 80 patients who had clinically evident carcinomas of the oral cavity or oropharynx. The second group consisted of 45 patients who, during routine physical or dental examination, were found to have asymptomatic clinical oral leukoplakia.

The smears were obtained directly from the le-

sions by means of a moistened tongue blade. The material was spread evenly on glass slides, fixed immediately in 70 per cent alcohol, and stained according to the standard Papanicolaou technic.

Malignant cells were found in 77 (96.3 per cent) of the 80 smears obtained from untreated carcinomas.

From 23 patients with residual or recurrent carcinoma after treatment, smears were positive in 17 (73.9 per cent), suspicious in 4 (17.4 per cent) and negative in 2 (8.7 per cent) prior to histologic confirmation. Malignant cells usually were less abundant in smears from such neoplasms, and more than one smear sometimes was necessary to establish a cytologic diagnosis. In several instances a positive smear was the first indication of treatment failure, and antedated clinical or histologic diagnosis by weeks or months.

The accuracy of posttreatment smears in 34 patients with no residual neoplasm was 93 per cent. In 133 such smears there were only two false positive reports (1.4 per cent) and eight suspicious reports (5.6 per cent).

Smears from each of 45 asymptomatic patients with clinical leukoplakia revealed increased cornification. Nine of these patients also yielded smears which exhibited cellular atypism. Premalignant and early malignant changes were demonstrated in each of the four biopsied lesions in this group.

The cytodiagnosis of clinically suspected oral cancer is accurate. However, since it gives no information concerning the presence or extent of invasion it should not replace histologic examination. Oral smears are capable of serving as evidence of therapeutic failures prior to the development of clinical evidence, and are useful in distinguishing between residual healing reaction or radionecrosis and carcinoma. Oral cytology is an excellent adjunct to follow-up studies of treated oral cancers and may be an effective modality in the early detection of cancer and precancerous lesions of the mouth.

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Therapeutics

Buccal and intramuscular use of streptokinase-streptodornase

H. D. Kautz. *J.A.M.A.* 172:701-702
Feb. 13, 1960

The usefulness of buccally or intramuscularly administered streptokinase-streptodornase (Varidase) for the treatment of edema associated with inflammation or infection has been investigated.

The beneficial effects of the enzyme are due to the streptokinase component of the mixture and can be explained by the enzymatic ability to liquefy fibrin thrombi through activation of plasmin in blood and lymphatic channels and by lessening the viscosity of edema fluid. It is claimed that streptokinase permits easier access to the area of infection than concomitantly administered antibiotics. Although this may be theoretically plausible, the experimental observations in animals were incapable of establishing such mode of action.

Among the conditions for which streptokinase-streptodornase may prove useful are those that may be associated with acute inflammatory processes, such as thrombophlebitis, cellulitis, abscess, sinusitis, hematoma, fractures, dental surgical procedures and any form of trauma.

Clinical experience with buccally or intramuscularly administered streptokinase-streptodornase has been extensive, and many favorable results have been reported. Relief of pain, quicker resolution of edema and more rapid subsidence of infection follow its use. However, few of the studies have been well controlled. This seriously hampers a precise evaluation of the drug. Because of the variable course (with or without treatment) of the conditions for which the enzyme is proposed, it is difficult to assess, in the absence of carefully controlled studies, what part in the over-all improvement of the patients can be ascribed to the drug.

In patients with edema associated with infection, streptokinase-streptodornase should be administered concomitantly with antibiotics. Comparative observations, with placebo medication substituted for the enzymes, therefore, would be difficult to carry out. In the absence of such studies, it is not possible to determine whether enzyme therapy has been a contributing factor in the accelerated improvement of the patients.

Clinical observations would tend to support the conclusion that the adjunctive use of the enzymes by either the buccal or intramuscular routes has a useful place in the management of inflammatory edema, with or without infection.

Side effects have been limited to urticaria, skin rashes and (in rare instances) local irritation and dryness. By either route, caution is advised when there is evidence of a defect in blood coagulation or impairment of liver function.

For buccal use, a tablet containing 10,000 units of streptokinase is placed in the buccal pouch or under the tongue and allowed to dissolve slowly. The usual dose is one tablet four times daily. For intramuscular use, a solution is prepared from the streptokinase-streptodornase mixture which provides 10,000 units of streptokinase per cubic centimeter. The proposed dose is 0.5 cc., injected twice daily.

Although the evidence that this enzyme compound exerts a beneficial effect is inconclusive, the foregoing doses may be regarded as a base line or guide.

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Treatment of pemphigus vulgaris with corticosteroids

E. Schlotter. *Hautarzt* 10:173-176 April 1960

Twenty patients with pemphigus vulgaris were treated with corticosteroids at the Dermatological Clinic of the University of Heidelberg, Germany. The initial dose depended on the severity of the disease and the localization of the bullous lesions on cutaneous or mucosal surfaces.

In instances in which no mucosal involvement occurred, the prognosis was favorable. Larger doses, however, were required when the initial lesions had spread to the oral mucosa. In patients in whom the lesions were confined to the skin,

remission was obtained with total doses of 500 units of adrenocorticotropic hormone (ACTH), 900 mg. cortisone or 860 mg. prednisolone. In patients in whom secondary spread to the mucous membrane occurred or pathologic changes of the mucosa appeared, the total doses administered were from 1.80 to 4.15 Gm. cortisone or from 1,135 to 2,380 Gm. of prednisolone. One of the 20 patients who had frequent severe exacerbations of the mucosal symptoms became free of symptoms on maintenance doses of 150 mg. prednisolone.

Undesirable side effects observed were nephrosis (although possibly present prior to treatment), increase in the blood sugar level, moon-shaped face and increase in body weight. These side effects could be treated appropriately, and there appeared no necessity to discontinue the corticosteroid therapy.

Although the corticosteroids (especially prednisolone) proved capable of slowing down the progression of the disease, the use of these hormones cannot be considered as a specific treatment for pemphigus vulgaris.

Follow-up examinations revealed that after 4 years and 2 months 14 patients (73.7 per cent) were alive and 12 of them were free from symptoms.

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Influence of thyroxine on the incidence of harelip in the 'Strong A' line of mice

D. H. M. Woollam and J. W. Millen.
Brit.M.J. No. 5181:1253-1254 April 23, 1960

The incidence of congenital malformations produced in laboratory animals both by hypervitaminosis A and by roentgen-ray radiation may be modified by the use of hormones and hormone antagonists. This paper records the findings of an experiment undertaken to determine whether the modifying action of vitamins, hormones and hormone antagonists extends to those deformities genetically determined rather than produced by a teratogenic agent.

Female mice of the Strong A line were divided into two groups. Animals in the control group received no treatment. Each animal in the experimental group received 0.1 mg. of thyroxin by

subcutaneous injection on both the eleventh and twelfth day of pregnancy. On the eighteenth day, all the animals were killed. The young were removed from the uterus and examined for the presence of cleft lip.

Of the 28 litters in the control group, 17 had at least one fetus with cleft lip; of the 207 young, 25 (12.1 per cent) had cleft lip.

Of the 19 litters in the experimental group, 5 had at least one fetus with cleft lip; of the 138 young, 6 (4.4 per cent) had cleft lip.

The administration of thyroxin to pregnant mice of the Strong A line has the effect of reducing the incidence of cleft lip in the offspring.

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The treatment of aphthous ulceration with gamma-globulin

William Fraser-Moodie. *Brit.D.J.* 108:326-328 May 3, 1960

In recent decades, the view that aphthous ulceration is caused by a virus has received support. In this study the subjects were 30 patients with severe aphthous ulceration. None had received recent treatment or ever had been treated with corticosteroids.

Before treatment was commenced, the gamma globulin level for each patient was ascertained. Swabs and specimens removed by curettage were collected and examined for a virus or for inclusion bodies. Serologic studies were made on the serum from all patients. In a double-blind study, 15 of the 30 patients were treated with gamma globulin and 15 were treated with isotonic sodium chloride solution. The gamma globulin level in each patient was estimated one week after the last injection. Blood cell counts were taken before and after the trial. Clinical results were assessed (1) at the end of the series of injections (the experimental subjects received four weekly injections of 0.1 Gm. gamma globulin per kilogram of body weight, intramuscularly or subcutaneously in a 10 per cent solution), (2) at the end of three months, and (3) after one year.

None of the patients was cured. Of the 15 patients treated with gamma globulin, 1 showed great improvement, 4 showed moderate improve-

ment, 5 showed slight improvement, and 5 no change at completion of the treatment. Fifty percent of these patients who had shown some improvement failed to maintain the improvement for one year.

Of the 15 control subjects, 1 showed great improvement, 1 showed moderate improvement, 3 showed slight improvement and 10 showed no change.

Bacteriological examination revealed no constant finding. No virus or inclusion bodies were detected. All patients showed normal blood pictures. There were no appreciable changes in the cell count after the injections of gamma globulin.

Gamma globulin does not appear to be a cure for aphthous ulceration. The results obtained with treatment by gamma globulin were similar to those obtained with a placebo.

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**Clinical evaluation of sulfadimethoxine,
a long-acting antibacterial sulfonamide,
in oral infections**

Joseph P. Cappuccio and Edward C. Dobbs.
J.Oral Surg., Anesth. & Hosp. D. Serv. 18:230-233
May 1960

A new sulfonamide, sulfadimethoxine, had been reportedly successful in ear, nose and throat infections, where the offending pathogens generally were similar to those in the oral cavity. The pharmacologic properties of sulfadimethoxine which especially recommend it for oral infections are its low dosage effectiveness when given orally and its long-acting potential.

Sulfadimethoxine was administered to 41 dental patients with the following conditions for which antibacterial therapy was indicated: dento-alveolar abscess (17 patients), cellulitis (12), pericoronitis (7), impactions (2), postoperative infection (2), and alveolitis (1).

Control of existing infection was obtained in 35 patients, with improvement noted in the remainder. No untoward reactions were experienced in this study.

A dosage schedule of four tablets (2 Gm.) immediately and two tablets (1 Gm.) daily thereafter is recommended for acute oral infections.

For pericoronitis, a schedule of two tablets immediately and one tablet daily thereafter is adequate.

Sulfadimethoxine is a valuable therapeutic aid in the treatment of oral infections, being highly effective and remarkably well tolerated.

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**Anxiety, apprehension and fear
at the dental office**

Theodor Anderes. *Schweiz. Mschr. Zahnk.*
70:424-427 May 1960

Although pain caused by dental procedures is experienced readily, the objective degree of the pain sensation is difficult to measure or even to define accurately.

Most modern dental procedures, however, are performed with little or no physical pain. After completion of dental treatment, many previously apprehensive patients will admit that they did not experience the discomfort, distress or agony which they had anticipated. But prior to and during the procedures, their anxiety, apprehension and fear still had persisted.

The dental patient's psyche, therefore, cannot be ignored by the modern dentist, who intends to render a complete health service by treating the mind as well as the mouth.

With the advent of the tranquilizing agents, it became imperative that the applicability of these drugs to dental practice should be investigated.

The following properties are prerequisites for any drug to be used at the dental office to induce emotional calm in obviously apprehensive patients: (1) minimal toxicity; (2) rapid onset of action; (3) long-lasting effect; (4) low incidence of side effects and aftereffects; (5) minimal habituation (drug addiction); (6) minimal acquired tolerance; (7) effectiveness and suitability for outpatient treatment of ambulatory patients; (8) inability to dull the senses, decrease the perception and interfere with mental acuity; (9) availability in forms suitable for easy administration, and (10) attainability at reasonable cost.

Hydroxyzine hydrochloride (Atarax) has been investigated by several researchers in Switzerland as well as in European and American countries,

and has been found to be an effective tranquilizing agent for use in dental practice. Its toxicity is extremely low; during the tests the drug was administered in doses exceeding 300 mg. daily for several months without untoward effects.

In the present study, hydroxyzine hydrochloride was used prior to 1,128 dental procedures performed in 305 patients. It was administered in tablet or dragée form (25 mg. daily), and provided adequate sedation in extremely apprehensive patients without causing reduction in the leukocyte count. The degree of sedative effects produced by this drug was significantly higher than that of placebos administered in double-blind tests. Duration of the tranquilizing effect varied between one and two hours, thereby providing ample time to complete most dental procedures. Besides a slightly decreased salivation and a mild dryness of the mouth, no other side effects were observed.

Hydroxyzine hydrochloride proved to be a valuable adjunct to the customary anesthesia in dental practice, especially suited for pretreatment administration in hypersensitive patients.

Flawil, Canton St. Gallen, Switzerland

**The aetiological significance
of *Candida albicans*
in chronic angular cheilitis
and its treatment with nystatin**

C. W. Shuttleworth and F. J. Gibbs. *Brit.D.J.*
108:354-356 May 17, 1960

In view of the potentialities of parasitic yeastlike fungi to produce low-grade infection in various parts of the body, particularly at cutaneous junctions, an investigation was made of seven patients with chronic angular cheilitis.

The patients were middle-aged, with the exception of one in his late seventies. All patients were in good general health and eating a normal full diet. Four patients consumed an excessive amount of carbohydrates; four were careless in cleaning their dentures. Four of the patients were women and three were men. Two had complete dentures in one jaw only, and five had upper and lower complete dentures. All patients had been troubled with soreness and cracking at the angles of the mouth for a long time, up to 19 years.

Bacteriologic examination showed the presence of yeasts both in the mouth and on the skin at the angles of the mouth. The microorganism was identified as *Candida albicans*, and all strains were found to be sensitive to nystatin. Sensitivity to nystatin was determined by the use of Evans "Sentest" tablets.

Treatment was aimed at eradicating the microorganisms from the mouth, and clearing up the lesions at the angles of the mouth. Patients were instructed to soak their dentures in a hypochlorite solution for half an hour each night. The four patients who were consuming an excess of carbohydrate foods were advised to reduce this as much as possible. Each patient was given a supply of nystatin cream to apply to the angles of the mouth three times a day.

In all patients the lesions cleared in from three to seven days. Two patients had no recurrence five weeks after ceasing to apply the antifungal cream; the remaining five patients found that the lesions tended to recur in from seven to ten days, but cleared in 24 hours if the cream was applied at the first sign of soreness.

The laxity of the facial muscles, partly caused by tooth loss and partly by anatomic peculiarities, allowed the mucocutaneous junction at the angles of the mouth to be kept constantly wet, and this undoubtedly was a major factor in permitting *C. albicans* to produce a localized intertrigo in these patients. Although the local condition apparently can be eradicated by the application of nystatin cream, the condition is bound to recur if the source of the infection is not reduced or eliminated.

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**Ilosone, the propionyl ester
of erythromycin**

Ronald S. Ping and Estell E. Morris.
Oral Surg., Oral Med. & Oral Path. 13:539-542
May 1960

The therapeutic value of four antibiotics—penicillin V in doses of 125 mg. and 250 mg., penicillin V potassium in doses of 250 mg., erythromycin, and erythromycin propionate—was tested in 1,255 patients treated for acute dental infections or for prophylactic reasons. The study was based on a

double-blind test, and the patients were questioned about results by a person other than the one who dispensed the sealed, opaque envelope containing the antibiotic. The results were judged to be good if subjective and objective improvement was noted within 24 hours; they were judged not good if the acute symptoms and signs extended beyond the first 24 hours without improvement.

The highest percentage of good results was produced by erythromycin propionate; of 123 patients receiving this antibiotic, the results were judged good in 114 (92.76 per cent). The usual adult dose administered was 250 mg. every six hours.

Penicillin V potassium in doses of 250 mg. was found to be second in efficacy, producing good results in 112 of 131 patients (85.65 per cent). The 250 mg. dose of penicillin V produced good results in 80.19 per cent of the patients treated with this antibiotic, and the 125 mg. dose of penicillin V produced good results in 74.38 of patients.

The use of erythromycin propionate for dental patients would avoid the allergic reactions which have been occurring with increasing frequency in patients receiving penicillin.

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'Gelastyp' in dental practice

H. E. Roth. *Deut.Zahnärztbl.* 14:414-416
June 22, 1960

During the past year, Gelastyp (Hoechst) has been used successfully at the oral surgical department of the Dental Clinic of the University of Würzburg, Germany.

The conditions in which Gelastyp dressings and tamponades had been employed, often without the use of other therapeutic agents, were as follows: (1) hemorrhages occurring after tooth extractions; (2) delayed wound healing after surgical removal of impacted lower bicuspids or molars; (3) alveolar infections; (4) perforations of the maxillary sinus, and (5) exposed pulps and perforated root canals.

Each cube of Gelastyp contains 5,000 units of penicillin G potassium and 0.4 mg. of Surfen, 1,3-bis(4-amino-2-methyl-6-quinolyl) urea. After

use of Gelastyp, not a single instance of postoperative infection occurred. Normal blood coagulation at the site of the operation was observed in all instances, and accidentally perforated maxillary sinuses could be closed by primary sutures.

In instances of alveolar hemorrhage a Gelastyp tampon soaked in a 1:1,000 epinephrine chloride solution should be applied to minimize the disintegration and to arrest the escape of blood.

A modification of the prepared cubical Gelastyp tampons to fit accurately the tooth socket would be an advantage in its use in dental and oral surgical practice.

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Abscesses in the oral cavity

Zahnärztl.Rundschau. 69:228 June 8, 1960

Q.—In the treatment of oral abscesses, depot penicillin usually is applied topically. However, all forms of penicillin, if administered over a prolonged period, may cause serious side effects. Does this fact not indicate that in the treatment of oral abscesses the use of sulfonamides should be preferred?

A.—It is not the known side effects of the penicillins but the development of bacterial strains resistant to these antibiotics which necessitates a change in the use of antibiotic agents in dental practice. Unfortunately, many of the sulfonamide compounds also produce side effects and sensitization. According to Sanchez, Aceves and Granda (1958), and Hanslik and Poppe (1958), the sulfonamide derivate, sulfamethoxypyridazine (Kynex in the United States, and Lederkyn in Germany) proved to be the antibiotic best suited for treatment of oral abscesses. The drug was administered orally by the author to 32 patients (between 3 and 69 years old) with oral abscesses. The daily doses varied from 375 mg. to 3 Gm., depending on the age of the patient. In more than 80 per cent, the result was excellent. Side effects such as a generalized, afebrile, morbilliform exanthem occurred in one patient; abdominal pain and vomiting in another, and in a third patient, the erythrocyte count was lowered to less than 2,000,000. No allergic reactions to sulfamethoxypyridazine were observed.

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Physiology

**Unfavorable influences exerted on the teeth
during the intake of extremely hot and cold
drinks or meals**

W. Gräf. *Deut. zahnärztl. Zschr.* 15:30-34
Jan. 1, 1960

Immediately after the discovery of the art of kindling a flame, primitive man used fire to cook his meals. His diet, therefore, consisted of some moderately heated foods, and no unfavorable effects were exerted on his teeth.

The diet of modern civilized man, however, consists of drinks and meals served at extremely different temperatures. Hot soups have an average temperature of 75°C., and hot drinks often exceed a temperature of 85°C. The discovery of refrigerating and freezing devices permit the inclusion of cold drinks (average temperature 5°C.) and ice creams or sherbets (average temperature -12°C.) into the normal diet.

Consuming a complete dinner exerts thermic stresses on the oral tissues, especially the teeth, which vary between -12°C. and 85°C. Many authors have reported that the great variation in temperature of our regularly consumed meals and drinks must exert unfavorable influences on the tooth structures causing fissures in the enamel. H. Rheder (1942) assumed that these stresses lead to a specific inflammation of the oral mucosa, gingiva, palate and tongue, which he termed "scalding" stomatitis.

W. Kollath, in 1949, found that the sudden changes in temperature (from -10°C. to about 80°C.) of drinks and meals taken in succession produce a recrystallization of hydroxyapatite in the enamel. More recently, I. G. Helmcke, in 1956, and P. S. Rothwell, in 1958, in electron-microscopic studies of human enamel, verified Kollath's findings.

None of these authors, however, has taken into consideration the actual temperature dif-

ferences occurring in the enamel after coming in contact with extremely hot or extremely cold drinks or meals.

An exact measurement of these temperature differences was the subject of an investigation carried out at the Institute of Hygiene and Bacteriology of the University of Erlangen, Germany.

Temperature variations were measured in upper incisors and bicuspids by registration of thermocurrents with a mirror galvanometer showing thermodynamically minute variations in the actual temperature of tooth structures.

The test dinner consisted of 250 ml. cold drink (5°C.), 250 ml. hot soup (75°C.), 250 Gm. hot meat and potatoes (65°C.) and 120 Gm. ice cream (-7°C.), consumed without interruption.

Immediately after the intake of cold drinks, the incisors showed a decrease in temperature to about 16°C., whereas in the bicuspids the temperature was reduced to 32.5°C. The hot soup increased the temperature in the incisors to 40°C. and in the bicuspids to 38.5°C. The hot main dish (meat and potatoes) increased the temperature to 45°C. in the bicuspids, whereas the temperature in the incisors remained almost stable. Consuming the ice cream lowered the temperature in the incisors to 24°C., and in the bicuspids to 17°C.

The test results revealed that an intake of drinks or meals having a temperature difference between -7°C. and 82°C. produces in the enamel a temperature difference of between 15°C. and 28°C.

These comparatively mild temperature variations within the tooth structures produced neither the syndrome "scalding" stomatitis nor recrystallization of hydroxyapatite, although both extremely hot and extremely cold drinks and meals caused pain sensations mainly at the dentinoenamel junction. Pathologic changes in the

hard tooth structures, the pulp and the periodontal tissue, therefore, are not caused by the diet of modern civilized man.

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Postnatal tooth development in cattle

W. A. Barry Brown, Paul V. Christofferson, Maury Massler and Marvin B. Weiss.
Am.J.Vet.Research 21:7-34 Jan. 1960

Interest in the teeth of cattle dates from the latter half of the nineteenth century when disputes as to the age of veal carcasses were settled by the state of eruption and amount of wear of the incisors. Studies on the influence of systemic factors on teeth have been hampered by a lack of knowledge concerning the details of tooth development in cattle, and especially the exact chronology of enamel development.

This study was designed to establish the chronology of formation of enamel and dentin in the teeth of cattle, to lay a firm foundation for future studies in tooth ring analysis.

The chronology of development of the permanent incisors and canines was established from an analysis of roentgenograms obtained *in vivo* from 869 purebred cattle living under optimal nutritional conditions.

In cattle, the development of incisors and canines follows an orderly sequence. The first incisor begins to develop enamel and dentin when the calf is 6 months old; the second incisor at 12 months, when the crown of the first incisor is completed, and the third incisor at 20 months, soon after the crown of the second incisor is completed (at 18 months). The canines begin enamel and dentin formation at 27 months, three months after the crown of the third incisor is complete.

Eruption and root formation follow a similar orderly sequence from the first incisor to the canine. The first incisor emerges into the oral cavity at 23 months, the second incisor at 30 months, the third incisor at 36 months and the canine at 42 months. Root formation is four-fifths completed at the time of tooth eruption.

No significant differences in the chronology of tooth development in the different breeds or sexes of dairy and beef cattle were noted, in spite of

relatively large developmental and genetic differences between dairy and beef cattle.

The study provides a baseline for future studies which may relate the effects of physiologic stress such as birth, weaning, pregnancy and lactation, and of pathologic factors such as nutritional deficiencies, fluorosis intoxication and infectious diseases on the enamel and dentin.

The study suggests the possibility of using intraoral roentgenograms for assessing the age of animals during the first four years of life.

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pH on the teeth of albino rats under various conditions conducive to dental caries

J. Haldi, W. Wynn, Mary L. Law and Katherine D. Bentley. *Arch.Oral Biol.* 2:46-56 May 1960

Many investigators have postulated a direct relationship between acid production from carbohydrates in the mouth and the initiation and progress of dental caries. This postulate is based on the assumption that the initial lesion of dental caries is produced by acid decalcification of enamel.

As it is possible to produce dental caries in the albino rat, it should be possible to determine, by frequent pH measurements on the tooth surface, whether and to what extent lowering of the pH on the tooth surface is a prerequisite to the initiation of caries in this animal. The present experiments were undertaken in the hope of shedding some light on this problem.

An antimony electrode was used, to give immediate and steady pH readings when applied to the tooth surface. The pH on the teeth of albino rats with reference to the time of eating was obtained by training the animals to eat their food allowance at scheduled times of the day.

The average pH on the teeth of intact rats before eating was about 8.0. After the rats had eaten a cariogenic diet, or sugar alone, the pH rarely fell as low as 7.0. In sialoadenectomized rats, the pH was lower than in intact animals.

It was concluded that in the albino rat dental caries may occur without the pH on the teeth

falling to what is regarded by many investigators as the decalcification level for human teeth.

The results of these experiments raise some questions concerning the acidogenic hypothesis of the etiology of dental caries.

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Eruption time of molars in experimental Sprague-Dawley rats

Klaus G. König and Thomas A. Marthaler.
Helv. odont. Acta 4:43-48 April 1960

The time and duration of the eruption of molars were studied in 201 young rats of the Sprague-Dawley strain from 32 litters at the Dental Institute of the University of Zurich, Switzerland. At the start of the study, the rats were between 20 and 25 days old, and the investigation was ended when the animals were between 30 and 45 days old.

During gestation and lactation all dams were kept on a uniform diet consisting of oats, corn, wheat, clover, ground meat, yeast and milk. To this diet, 1 per cent of McCollum-Davis' salt mixture, 2,500 units of vitamin A and 3,000 units of vitamin D₂ per 1 kg. of body weight had been added.

Two days after birth, each of the 32 litters was reduced to eight pups. From the fourteenth to the twenty-fifth day of life, and from the thirtieth day until the completion of tooth eruption, the oral cavity of all experimental rats was examined daily by use of an ear speculum. From the twenty-fifth day of life, the rats were kept on Stephan's cariogenic diet, rich in carbohydrates (especially saccharides) and poor in fats.

The following conclusions were drawn:

1. Sex difference played a significant part in general growth and development as well as in gains in body weight, but hardly any part in the time and duration of tooth eruption, especially that of molars.

2. The variability in the time and duration of eruption of the molars appeared to be decreased within rats of a litter, but significantly increased within rats of different litters.

3. The order of molar eruption was as follows: (1) lower first molars, 15.58 days \pm 0.985; (2) upper first molars, 16.79 \pm 0.877; (3) lower second molars, 18.95 days \pm 0.761; (4) upper second molars, 20.27 days \pm 0.695; (5) upper third molars, 36.34 days \pm 1.640, and (6) lower third molars, 36.52 days \pm 1.534. These figures were based on the calculation: 0.1 day = 2 hours and 24 minutes, and 0.01 day = 14.4 minutes.

4. In the majority of rats investigated, the upper and lower third molars erupted simultaneously.

The results of the investigation confirmed Schour and Massler's findings that in rats the lower first and second molars erupted earlier than their counterparts in the upper jaws, but contrasted with their findings in regard to the eruption time of third molars. Schour and Massler reported that the upper third molars erupted at least three days earlier than the lower third molars. In the present study, there was an insignificant difference of 0.18 days (not quite four hours) recorded.

Schour and Massler's investigation, however, was made in Osborne-Mendel rats, whereas the present study was made in Sprague-Dawley rats. It is possible that the difference in the eruption time of the third molars is caused by the specific characteristics manifested by these two strains.

The average eruption times of molars, numerically and logarithmically calculated, are presented in tables showing the eruption at periods in which 10 per cent, 50 per cent and 90 per cent of the molars were present. This approach was selected by the authors in an attempt to demonstrate the usability of logarithmic curves for dental statistics on tooth eruption and caries incidence.

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Histology

Formation of secondary dentin in deciduous teeth

Sohiti Isokawa and Yoshihisa Toda.
J.Nihon Univ.School Den. 2:107-108 March 1960

Longitudinal ground sections were prepared from 180 deciduous teeth extracted from young patients. The sections were stained and examined under the microscope.

Of 79 incisors, secondary dentin was observed in 77 (97.5 per cent). Secondary dentin formation also was noted in 50 (94.3 per cent) of 53 canines and in 44 (91.7 per cent) of 48 molars.

The results confirm the report of Ireland (1941) that secondary dentin is formed in deciduous teeth.

Nihon University School of Dentistry, Tokyo, Japan

Metabolic changes in enamel and dentin

S. Gräff. *Zahnärztl.Praxis* 11:138 June 15, 1960

Patients with gastric ulcers and also those with certain types of neuroses have been treated, occasionally, with orally administered silver solution. The skin of patients who used this solution for a prolonged time exhibited a specific pigmentation varying from light grey to dark black. These pigmentary spots never disappeared. The discoloration of the skin obviously was caused by deposition of silver particles in the skin. However, similar deposition of silver particles took place in the tissues of the reticuloendothelial system affecting the liver, the spleen, the lymphatic system and the kidneys. No functional damage, however, was associated with the pigmentation. The pigmented condition of the skin is called argyria.

After multiple extraction of teeth in a patient with argyria, it was observed that the pulp, especially in the region of the odontoblasts, showed a

dense deposition of dark silver particles. Unusual was the fact that the silver particles formed bead-like chains inside the fibers of the odontoblasts and discolored the enamel. Only one explanation is available for such a phenomenon. The silver particles must have wandered through the blood stream to the pulp where they appeared as minute deposits not only in the processes of the odontoblasts but also in enamel and dentin.

The supposition that a continuous metabolic process takes place in the dentin and the enamel seems justified. Histologic examination revealed that a stream of fluid passes from the pulp over the dentin to the enamel where, after supplying the enamel with cell fluid, the fluid reverses its course. The external enamel layer is less involved in this metabolic process than the dentin fibers.

The result of this study demonstrates that an influence on the tooth development and formation can be exerted by extraneous factors which also are active in the integration and disintegration of calcium within the enamel prisms. This fact may explain the action and function of fluorine and other trace elements in preventing and reducing the incidence of dental caries; it also furnishes the possibility of increasing the individual resistance to caries by artificial enrichment of the calcium contents of the hard tooth structures with orally administered doses of calcium derivatives.

(13b) *München-Gräfelfing, Germany*

Studies on the physical properties of fluorosed enamel—

I. Microradiographic studies

E. Newbrun and F. Brudevold. *Arch.Oral Biol.* 2:15-20 May 1960

Thirteen permanent teeth were obtained from persons who had lived continuously in Clovis, N. Mex.; Colorado Springs, Colo.; Doland, S. D., and Post, Texas, where the water supply contains 2.2, 2.7, 3.6 and 5.0 ppm fluorine (fluoride ion), respectively. The teeth were sectioned, ground, polished and examined microradiographically.

Twelve of the 13 teeth showed macroscopic evidence of mottling in the form of opaque white, white-yellow and brown spots. The degree of mottling did not correspond entirely to the level of fluorine in the water supply.

Microradiographically, most of the teeth showed areas of radiolucency. The radiolucent areas were limited to the subsurface, and a radiopaque surface layer could be observed. The spread of the radiolucent areas varied considerably, and in no way could be related to the level of fluorine in the water supplies.

However, the depth of the radiolucent areas appeared to be governed directly by the concentration of fluorine in the drinking water. At lower fluorine levels all the radiolucent areas were found in the outer third of the enamel but in the teeth from Post (5.0 ppm fluorine), the depth of the radiolucent areas was increased so that half and even three-quarters of the enamel thickness was involved. Within the affected enamel, the interprismatic substance and areas along the edge of each incremental layer appeared to be the most radiolucent.

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Changes in the metabolism of calcium and phosphate in the facial bones and teeth of rats with alloxan diabetes

H. Betzler and H. Riedel. *Stoma* 13:77-111
May 1960

Alloxan diabetes is a condition resembling diabetes mellitus (severe hyperglycemia). In animals, the disease is produced experimentally by the injection of from 100 to 200 mg. of alloxan (mesoxalyl urea) per kilogram of body weight. Deficient pancreatic activity and selective necrosis of the islets of Langerhans are the initial symptoms.

Because of the established symptomatic similarity between alloxan diabetes in animals and diabetes mellitus in man, pathologic changes in the metabolism of calcium and phosphate occurring after alloxan injection were studied in the teeth

and facial bones of eight 4 week old albino rats at the West German Dental Clinic of the Medical Academy of Düsseldorf, Germany.

Histologic examination of specimens obtained from the animals sacrificed five days after the alloxan injection revealed the presence of symptoms resembling those of periodontitis often associated with diabetes mellitus in man. In the control group there were no inflammatory or degenerative changes in the periodontal membranes, gingiva and alveolar bones.

Additional studies were carried out to establish whether alloxan diabetes (and, therefore, diabetes mellitus) exerts an influence on the metabolism of calcium or phosphate in teeth and facial bones. These metabolic changes within tooth structures have been observed by Franke (1950) and Macleod (1951) in diabetic patients.

Immediately before delivery, 12 pregnant albino rats each received a single subcutaneous injection of 200 mg. of alloxan per kilogram of body weight. The control group consisted of 12 female rats of approximately the same age and in a similar state of pregnancy. After birth, the 45 offspring of the experimental animals were nourished by the control animals. After three weeks, the 45 young rats received 0.5 microcuries radioactive calcium (C^{45}) and 5 microcuries radioactive phosphorus (P^{32}) in a 1 cc. solution, by Rush's stomach catheter. Two days later, the animals were sacrificed. Although the course of the radioactive substances could be determined in teeth and facial bones, there was no evidence for the assumed relationship between any form of diabetes and disturbances in the metabolism of calcium and phosphate within the dental and osseous structures. If this metabolic phenomenon is observed in dental patients with diabetes, it probably is a matter of coincidence.

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The effects of the absorption of fluoride

Nicholas C. Leone, Clyde A. Stevenson, Byron Besse, Lloyd E. Hawes and Thomas R. Dawber. *A.M.A. Arch. Indust. Health* 21:326-327 April 1960

A roentgenographic study of 546 persons between the ages of 30 to 70 years in Framingham, Mass., where the water contains less than 0.1 ppm fluorine (fluoride ion), yielded findings which support the view that an insufficient amount of fluorine in adult bone is disadvantageous.

The following lesions were noted: increased bone density, coarsened trabeculation, hypertrophic changes including ligamentous calcification and bone spurs, osteoporosis, calcified nodes and vessels, gallstones, compressed vertebrae, degenerated disks designated as "narrow interspaces," calcified intervertebral disks, tumors and cysts of soft tissue and bone, prostatic calcification and arthritis.

Among the 546 persons were 229 instances of osteoporosis, of which 77 were severe and advanced. A considerable number of these occurred in the younger age groups, particularly in men. There also was an unusually high incidence of calcified nodes in the right side of the abdomen.

Instances of increased bone density and coarsened trabeculation (when compared on the basis of prevalence per thousand of population) were significantly fewer than those found in Bartlett, Texas (with a fluorine concentration in the drinking water of 8.0 ppm), but comparable to the rate in Cameron, Texas (with a fluorine concentration of 0.4 ppm).

When the prevalence rates of ligamentous calcification (bone spurs) were compared, a higher rate was noted in Framingham.

The small number of instances of increased bone density and of coarsened trabeculation, and

the unusually large number of instances of osteoporosis in the Framingham group, support the hypothesis that disadvantageous effects on the bone structure of the adult population may be associated with the prolonged use of drinking water that contains an insufficient concentration of fluorine.

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The chemistry of antibiotics

Editorial *J.A.M.A.* 172:704-705 Feb. 13, 1960

During the past decade the tremendous volume of research that has been pursued throughout the world in gathering information on the chemotherapeutic properties of antibiotics as well as identification of new antibiotic compounds which resulted in the synthesis of penicillin simultaneously demonstrated a fascinating aspect of the biologic action of these agents and the cellular metabolism.

The trail of investigative efforts has led not only to the development of new antibiotics such as chloramphenicol, the tetracyclines and erythromycin, but also to the revelation of compounds that are effective against infection by selected fungi.

Although the selective inhibition of the growth of tumor cells or of viruses that contribute to metaplasia of cells has resulted in no immediate therapeutic possibilities, the long-term results in this endeavor may be essential for the understanding of the pathogenesis of malignant growth.

Investigations into the microbiology of actinomycetes, filamentous bacteria which produce actinomycosis in man and animals, have been promising. It is a strange phenomenon that certain microorganisms attack others and that suppression of some types of infection enhances the bacterial growth and permits the emergence of antibiotic-resistant strains.

Considerable progress may be recorded also in the understanding of the mechanism of antibiotic action. The chemotherapeutic effect varies from one antibiotic to another, with one fundamental action manifest, that is, the compounds are more toxic to microorganisms than they are to human or animal tissues. There is a difference in selective

toxicity, whereas minor changes in the molecule may result in significant change or even loss of therapeutic activity.

It is obvious that a great deal of the mystery of origin and chemical structure of the antibiotics has been exposed. It is necessary, however, to take into consideration the statement made by Fuller Albright a number of years ago: "A great deal of progress has been made, a great deal of investigation remains for the future."

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Enzymatic activity in dentin fluid

Theo Spreter von Kreudenstein.

Deut.zahnärztl.Zschr. 15:371-375 Feb. 1, 1960

The activity of the various enzymes present in the dentin fluid was investigated at the Dental Institute of the University of Kiel, Germany.

The experimental material consisted of cattle and pig teeth, freshly extracted from young animals. As in human teeth, the dentin of freshly extracted animal teeth shows a measurable uptake of oxygen about five hours after extraction, depending on the activity of specific enzymes present in the dentin fluid.

The dentin fluid of animal teeth contains almost the same enzymes (aldolase, lactic dehydrogenase, glutamate pyruvate aminopherase and glutamate oxalacetate aminopherase) as the blood serum. However, if the enzymatic activities in the blood serum and the dentin are compared, the aldolase in the dentin fluid produces only a fifth of ketophosphoric acid produced in the blood serum, whereas the lactic dehydrogenase in the dentin fluid catalyzes almost six times as much oxidasic alpha hydroxy acid to alpha keto acid as the same enzyme catalyzes in the blood serum.

In this investigation, under the term "dentin fluid" not only the liquid contents of the dentin tubules were considered but also the amount of liquids found between the crystallites of the dentin and the collagenous fibers.

With optical enzymatic test methods, it was established that interspaces between the crystallites of dentin and the collagenous fibers of about 50 angstroms can be observed and their liquid

contents measured, whereas the interspaces between one dentin crystallite and another can be determined to 10 angstroms.

The long, threadlike processes of the odontoblast also contain liquid matter which may be considered as part of the dentin fluid showing a specific enzymatic activity.

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Current information on the quantities of fluoride found in air, food, and water

J. Cholak. *A.M.A. Arch. Indust. Health* 21:312-315 April 1960

Little published information is available concerning the concentration of fluorine (fluoride ion) in the atmosphere generally. The average concentration of fluorine as hydrogen fluoride in the atmosphere of a number of cities in the United States ranges from 3 parts per billion to 18 parts per billion.

Fluorine, which occurs in the earth's crust (only in chemical combination with other elements) in an average concentration of 300 ppm, is absorbed by plants to a degree which depends, in part, on the solubility of the fluoride-bearing mineral present in the soil. With few exceptions, the concentration of fluorine in plants is seldom below 0.10 or above 10 ppm. The mean daily intake of fluoride with food consumed by persons residing in certain communities in the United States has been found to range between 0.34 and 3.13 mg.

The calculated daily intake of fluoride with food and drink in England is 0.6 mg. for children 5 to 14 years old, 1.3 mg. for housewives and 1.8 mg. for men; the largest portion of fluoride taken in is believed to be due to the large quantities of tea consumed.

Fluorine generally is present in all surface and underground waters, the content ranging from 0.016 ppm in rainwater to 2,800 ppm in the waters of Lake Nakuru in Kenya. It is doubtful that water entirely free of fluorine ever will be found, if the sample taken for analysis is sufficiently large.

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Psychology

Hypnosis in dentistry

S. Damseaux. *Rev. Belge stomat.* 56:283-290
Oct.-Dec. 1959

The subject of hypnosis in dentistry (hypnodontics) is becoming increasingly important and in the future will be an integral part of the dental practitioner's knowledge.

In recent literature, numerous references have appeared implying that hypnosis is synonymous with psychosomatics, a contention which obviously is erroneous. Hypnosis is one of the technics which may be used to control psychosomatic conditions.

Dental educators realize that the time for a total separation of psychologic and mechanical evaluations based on individual characteristics of the patient has passed, and that understanding of the psychosomatic aspects is not only valuable to the practicing dentist but indispensable in diagnosing and treating conditions associated with psychic, emotional or mental factors.

Perhaps the greatest problem in dental practice is pain control. It is pain that for the most part is responsible for dentophobia. This phobia keeps millions of potential patients from obtaining the benefits of dentistry. Every dentist knows how to eliminate organic pain, but few have been successful in combating nervous apprehension and abnormal dread or fear which many patients bring to the dental office. Not until dentists are able to allay the fear of pain are they practicing modern dentistry. The control of fear can be most readily accomplished by hypnosis.

The dentist first should attempt to build up a favorable attitude in the patient's mind by suggestions to relax. Hypnotic sleep is an extremely deep form of relaxation brought on by the patient himself. It is not an unconscious sleep; the condition is pleasant and resembles daydreaming.

Whether the dentist seeks the patient's response in the waking state by suggestions alone or wishes his cooperation in obtaining the hypnotic sleep state, preliminary education pertaining to accepting hypnosis is necessary. Such an education enables the patient to form in his own mind the mechanism for acceptance.

Bruxism is another dental problem which may be alleviated by hypnosis. In most instances it will be necessary to correct bruxism when recognized, otherwise irreparable damage to teeth and periodontal tissue may result. The control of this and other harmful habits can be accomplished by using prehypnotic or hypnotic suggestions which should be phrased to fit the condition present.

More and more dentists recognize the great potentials of suggestions, whether used prehypnotically, hypnotically or posthypnotically. Hypnosis in dental practice, however, must not be employed until the practitioner is thoroughly familiar with all the principles involved. When properly used, there is no danger in hypnosis, whereas in unskilled hands detrimental conditions may be induced which can lead to serious complications.

Hypnosis is not an art to be mastered only by a few. Any conscientious dentist interested in its use and having a sincere desire to learn can master the technic, which will afford him new roads of approach in dealing with his patients. In understanding individual problems and in recognizing the possibility of emotional involvement in the relationship between dentist and patient, the dentist, using hypnosis can approach any type of defense mechanism in the behavior of the patient more successfully and with a better and more sympathetic understanding for the patient.

Stomatological Institute, University of Brussels, Belgium

The dental care of geriatric hospital patients

J. R. Moore. *Geront.Clin.* 1:65-70 1959

The Ministry-of-Health Pilot Dental Scheme in the Sunderland Hospital Management Committee area of England is concerned entirely with hospital patients, particularly with those who are hospitalized for four weeks or longer.

The objects of dental treatment for all classes and ages of patients are broadly threefold: (1) to eliminate sepsis and its accompanying symptoms and side effects, (2) to maintain or restore an efficient masticatory function, and (3) to contribute to an esthetically pleasing facial appearance.

Even the presence of very few natural teeth may be adequate for the patient's masticatory needs. The conservation of even a few healthy permanent teeth in elderly persons is important, especially if these teeth are in occlusion or if they may form an anchor for artificial dentures. The dentist's aim should be to provide a satisfactory masticatory machine to meet the requirements of each patient, based, if possible, on natural teeth and supplemented, where necessary, by artificial dentures.

The esthetic aspect too often is underestimated in the aged patient. Many elderly patients attach great importance to this aspect. Dental treatment may help to rehabilitate a patient for life outside the hospital.

Regrettably, in many hospitals the patients receive only emergency dental treatment; that is, they are seen by the dental staff only if the patient has a specific complaint or because the physician or surgeon feels that dentistry can play an imme-

diate part in their medical treatment, such as the preparation of the mouth for radium treatment in instances of malignant disease or the removal of teeth or roots in trigeminal pain. These procedures are important but they cover only a small part of the field. The oral condition of the average geriatric patient is far from satisfactory. The first and most important service the dental department can offer all classes of geriatric patients is to provide an efficient oral hygiene service to improve and maintain the care of the patient's mouth during his stay in the hospital. All patients should be examined by the dental surgeon and dental hygienist. With the approval of the physician in charge, the patient should be instructed and encouraged to care for his mouth and teeth. Individual instruction is necessary.

The dental department should provide toothbrushes, tooth paste and suitable containers for dentures. These requisites are supplied by the Sunderland General Hospital.

The dentist then should prepare a report on each patient with an assessment of the dental condition and a suggested treatment plan which takes into account the past dental history, the patient's complaints and needs and the response made to the dental hygienist's efforts.

The report should be discussed with the physician and such amendments made as appear necessary in the light of the patient's medical condition, prognosis and suitability for treatment. The actual dental treatment requires special techniques for dealing with bedfast patients, as well as much patience and understanding.

*Sunderland General Hospital, Sunderland,
Durham, England*

Case reports

Chronic parotitis

J.A.M.A. 173:1871 Aug. 20, 1960

Q.—After eating, a patient has swelling of both parotid glands, but can express saliva which is without purulent material by pressing on these glands. As a rule, the condition exists in only one gland at a time, and occasionally is accompanied by a low-grade fever. Apparently there is no obstruction of Stensen's duct, but clinical examination seems to indicate that this condition affects the glandular portion itself. This condition started in the left parotid gland and has been present for ten years, but in the past year it has affected the right gland intermittently. What is the probable diagnosis and the best treatment?

A.—Apparently this patient has chronic bilateral parotitis, which often is due to alpha hemolytic streptococci. Antibiotics are of little, if any, value, but a vaccine prepared from material expressed from the parotid ducts often will cause the symptoms of this condition to disappear. Such a vaccine must be administered weekly for several months.

535 North Dearborn Street, Chicago 10, Ill.

Anaphylactoid reaction to oral penicillinPerry B. Miller. *U.S. Armed Forces M.J.*
11:451-453 April 1960

The following case report depicts a severe anaphylactoid reaction to a tablet containing 200,000 units of crystalline penicillin G.

A 34 year old pilot was brought to the hospital emergency room. His wife said that about 25 minutes earlier he had taken a penicillin tablet (left over from a previous prescription) for a slight earache. Within a minute he had complained of weakness, generalized pruritus, sneez-

ing, and swelling of his lips and tongue. He went to bed and asked for a chlorpheniramine maleate tablet. After ten minutes he arose to go to the bathroom, but collapsed after a few steps. Fecal incontinence occurred and he could not be aroused, remaining unconscious during the 15 minute trip to the hospital.

A past history was obtained after the patient's recovery. In 1951 a skin rash had developed after an injection of penicillin in beeswax. Subsequently, on a number of occasions he had received penicillin parenterally without reaction. Mild urticaria first developed in January 1959 and recurred irregularly. In February he had received a course of oral crystalline penicillin G as prophylaxis against scarlet fever, for which his daughter was being treated. Apparently, he had mild urticaria at this time. In April and May 1959 he had several attacks of nausea, weakness and swelling of his lips and tongue. He noticed that these episodes all occurred shortly after eating, and that he had drunk milk on each occasion. A physician suggested that abstinence from dairy products was worth a trial. The patient adhered to this suggestion and had no recurrence of urticaria or angioneurotic edema until the onset of the anaphylactoid reaction.

Physical examination revealed a well-developed, well-nourished, comatose man. His blood pressure was 30/0 mm. Hg., pulse rate 90. His lips and tongue were moderately swollen. A few scattered wheezing rales were heard on auscultation of the lungs.

Epinephrine 1:1,000, 0.5 ml. was given intravenously and 1,000 ml. of 5 per cent dextrose by intravenous drip was administered. Through the intravenous tubing 20 mg. of methoxamine hydrochloride and 100 mg. of soluble hydrocortisone were given. The systolic blood pressure rose to 70 mm. Hg. An intravenous infusion of 500 ml. of 5 per cent dextrose in water containing 2 ml. of levarterenol bitartrate 0.2 per cent was initiated, after which a systolic blood pressure of 100 mm. Hg. was maintained with ease by adjustment of the drip. The patient became semiconscious about 15 minutes after admission to the hospital and regained full consciousness in another 10 minutes. He complained of weakness and some vague abdominal pain, and during the next 30 minutes vomited several times. The patient was

transferred to the intensive treatment ward, where 0.3 ml. of 1:1,000 epinephrine was injected subcutaneously and 800,000 units of penicillinase was injected intramuscularly. The intravenous drip of levarterenol was discontinued about one hour after its initial administration. During the night, 1,000 ml. of isotonic saline containing 100 mg. of soluble hydrocortisone was given by intravenous drip at a rate of 100 ml. per hour. Acthar gel, 40 units, was injected intramuscularly the next morning, at which time the patient was entirely asymptomatic. He was discharged three days after admission. He was warned of the extreme danger that any contact with penicillin represented to him, and advised to eliminate dairy products from his diet.

Although anaphylactoid reactions to oral penicillin are rare, one should observe the same precautions in its use that one takes before the parenteral administration of penicillin.

The contamination of milk by penicillin as a result of the treatment of mastitis in dairy cattle by the installation of the drug into the teat duct has further complicated the problem of penicillin allergy. Instances of chronic urticaria have resulted from the ingestion of milk and other dairy products contaminated with penicillin (Zimmerman, 1959).

U.S. Air Force Hospital, Eglin Air Force Base, Fla.

Multiple nevoid basal-cell epithelioma, jaw cysts and bifid rib: a syndrome

Robert J. Gorlin and Robert W. Goltz.
New England J. Med. 262:908-912 May 5, 1960

Although the dental literature contains reports of a considerable number of cases of multiple dentigerous or follicular cysts of the jaw, in only a few instances (Gross, 1953, and Thoma, 1959, for example) do the reports mention skin or rib lesions. Many cases of multiple nevoid basal-cell epithelioma have been described without mention of dental changes.

The authors recently have observed two patients with findings in common, the condition being considered a distinct syndrome involving multiple nevoid basal-cell epitheliomas, jaw cysts and bifid rib.

A 38 year old unmarried woman had had multiple "dentigerous" cysts scattered throughout the jaw since the age of about seven years. The cysts had been removed many times, but healing of the bony defects had been poor, with frequent recurrence of the cysts. Biopsy revealed true cysts having a typical stratified squamous epithelial lining. When seen recently, the patient had numerous elevated skin nodules about the eyes, nose, ears, lips and chin, and one on the fifth finger of the left hand. The lesions included basal-cell epithelioma of cystic and pigmented varieties and trichoepithelioma. Roentgenographic examination revealed bifurcation of the fourth rib anteriorly on the left side.

A 26 year old woman had a history of several keratinizing basal-cell carcinomas and lesions similar to epithelioma adenoides cysticum removed from her face within the past few years. A "dentigerous" cyst had been removed from the lower right second molar region when the patient was ten years old. Roentgenograms revealed no additional cysts and did not suggest bifid rib.

To characterize the cysts of the jaw as "dental" or "dentigerous" appears to be unjustified. To be sure, such cysts may arise in juxtaposition to the teeth, causing dilaceration of the roots, if the teeth are in the developmental stage. The stratified squamous epithelial lining and the desquamated epithelial debris within the cystic lumen do not necessarily imply a relation either with odontogenic cysts or ameloblastoma.

Multiple nevoid basal-cell epitheliomas, jaw cysts and bifid rib constitute a distinct syndrome. The skin lesion, which microscopically cannot be differentiated from ordinary basal-cell carcinoma, arises in childhood along with simple epithelial-lined cysts of the jaws. Scoliosis, agenesis of the corpus callosum milia, and broad nasal root may be part of the symptom complex, but more patients with this syndrome must be studied before this can be ascertained. Sarcomatous degeneration of the tissues surrounding the jaw cysts, noted occasionally, should be evaluated by further study. Inheritance seems to be autosomal dominant, with poor penetrance. (Since this paper was submitted for publication several additional cases have been reported.)

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General

Experiences with a new mobile dental clinic

Hans Joachim Maletz. *Deut. Stomat.* 10:537-541 July 1960

The first of several mobile dental clinics designed to serve the population of the East German district Nordhausen and of some of the isolated communities of the neighboring districts was placed in operation by the dental staff of the Hospital and Polyclinic of Bleicherode in July 1959.

The 35-foot van, officially named "operating dental ambulance," was produced by the Erfurt Motor Works in Zwickau, Saxonia, at a cost of approximately DM. 74,000 (\$15,000) and included an operating room, a reception room, a recovery room, a combination of dental laboratory and darkroom, a roentgenographic examination room, small offices for the two dentists and one dental assistant, an independent water supply and a heating plant (oil). The obvious lack of space was overcome by excellent planning. Twelve months' experience with this mobile dental clinic has demonstrated that it provides facilities for an efficient dental (mainly pedodontic) service comparable to those of private dental offices. In the operating room, there are two modern dental chairs and units, cabinets and all accessory items permitting two dentists and a dental assistant to work simultaneously.

Most communities visited by the mobile dental clinic do not possess adequate facilities (dental

offices or clinics and school dental clinics). Usually, the van parks in front of a school building, sometimes after traveling great distances, and the school children are treated immediately, without disturbing the class schedule. Children requiring extensive or complicated treatment procedures are referred to the Hospital and Polyclinic of Bleicherode.

Return visits are made on an average of from three to five months. An efficient appointment schedule (including periodic checkups and recall visits) permits helping any child to have and maintain as healthy a dentition as possible. If time permits, the staff will also provide an immediate dental service for juveniles and adults who have dental or oral defects which interfere with their general health and welfare.

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Occupational dermatitis in dentists

D. A. Wallace and J. P. Weinmann. *Internat. D.J.* 10:75-88 March 1960

Occupational dermatitis among dentists almost always is of the contact type. Available surveys indicate that about 3 per cent of all dentists suffer at one time or another from occupational allergic eczematous dermatitis, and that the condition threatens to be disabling to somewhat less than 1 per cent of all dentists.

The history is of the greatest importance in diagnosis. Skin eruptions caused by allergic reactions to drugs can mimic the appearance of any dermatosis. The location and pattern of the lesions often are informative. Of the various skin tests, the patch test is the one most highly recommended.

The likelihood of dermatitis increases with the frequency and intensity of exposure to irritants. A weakened or diseased skin is more susceptible than a normal skin. Avoidance of the responsible substance usually will be followed by complete remission. Self-treatment is hazardous, because many drugs used to relieve pruritis and other dermatologic symptoms contain anesthetics and other sensitizers which may aggravate the condition.

Contact dermatitis may be caused by primary irritants or by sensitizers; usually, it is caused by a combination of factors. The most common

Figure 1 The mobile dental clinic

Figure 2 Operating and examination room

Figure 3 Cabinets and sink

Figure 4 Autoclave and reception desk

causes are contact with local anesthetics and instrument or pulp canal disinfectants. Excessive exposure to water and hand cleansers may predispose the skin to contact dermatitis. Healing usually occurs soon after exposure to the causative substance is stopped.

In most instances, the prognosis is favorable, but once hypersensitivity is established it is likely to persist. The universal remedy is to avoid contact with known allergens, and to minimize exposure to cleansers and irritants.

The following specific suggestions to dentists are offered:

1. Wash the hands only when necessary, and only as vigorously as necessary.
2. When possible, use heat rather than chemical methods to disinfect instruments.
3. Handle drugs and dental materials with instruments, to avoid their contacting the skin.
4. When air is expelled from the hypodermic syringe, avoid getting a spray on the face. Do not let the anesthetic solution expelled from the needle come in contact with the skin.
5. Have the patient rinse his mouth with water immediately after injection of a local anesthetic. The dentist at this time may wish to rinse his hands.
6. If necessary, use rubber gloves or finger cots when injecting an anesthetic. Have the rubber items cleaned and dried after each use.
7. Take the best possible care of the hands. If creams or lotions seem desirable, consult a dermatologist and use only those items which he recommends.

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The World Refugee Year and the dental profession

Editorial. *Internat.D.J.* 10:107-109
March 1960

The purposes of World Refugee Year (to end in mid-1960) are "to focus interest on the refugee problem, to encourage financial contributions from governments, voluntary agencies and the general public and to encourage additional opportunities for permanent . . . solutions through

voluntary repatriation, resettlement or integration, on a purely humanitarian basis." Fifteen years after the end of World War II, there are still millions of refugees requiring assistance. Refugee camps now have been in existence so long that, in some of them, schools, vocational training centers, health centers, dental clinics and hospitals have had to be established. There are still refugee camps in Austria, Germany, Greece and Italy, with thousands of men, women and children in them. For the World Refugee Year, over 60 nations have joined in a special effort to bring relief to these refugees. The heads of the world's chief faiths have issued special messages in support of this humanitarian venture.

Many individuals have assisted refugees. A dentist in Italy, himself a former Hungarian refugee and the father of three sons, assumed responsibility for training seven Hungarian boys as dentists and dental technicians; the seven built their own quarters, continued their education and now are well on the way toward achieving their ambitions to become useful and self-supporting citizens—three as dentists and four as dental technicians.

A woman journalist in Scotland raised \$400 from businessmen to aid a Hungarian dentist who wished to come to Glasgow to take a dental examination which would enable him to practice his profession in Britain. A Scottish dentist offered employment to the Hungarian dentist as soon as he passed his examination.

Probably there are no more than 100 or 200 refugee dentists; it is difficult to obtain exact figures, as many have been forced to take up new vocations to make a living. In common with other professions, there are legislative restrictions in many countries on the registration of dentists with foreign degrees. The problem is difficult but not impossible of solution. One suggestion is that qualified refugee dentists be allowed to operate in public dental services where they would be subject to supervision as regards the quality of their work. After a satisfactory period of probation, they would be entitled to confirmation of their appointments and provisional registration, or would be required to take an abbreviated course arranged with university authorities.

Whatever the solution, there is a moral obligation on the part of the dental profession and of

each dentist to assist our colleagues in distress to rehabilitate themselves. A little effort, a little money, a little time, spent by the dentists the world over soon would solve the problem of the refugee dentist.

University of Liverpool, Liverpool, England

Fire

Bruce M. Jackson. *J.Canad.D.A.*
26:276-277 May 1960

On December 16, 1959, a fire in downtown Kitchener, Ontario, destroyed three large buildings. Among the offices destroyed were those of five dentists, including the author's. Three dentists saved part of their current records. All older records, histories and roentgenograms were lost. The heaviest loss was in equipment and supplies, and unfortunately this loss could be calculated only approximately, as only one dentist had an inventory list. As nearly as could be estimated, the losses of the five dentists totaled \$48,000, or an average of \$9,600 each. Because replacement costs were much higher than the depreciated value of equipment, the loss was even greater. In addition, lost time was also a factor.

Two of the dentists were able to resume practice at other dental offices by using second operating rooms. The other three dentists were not able to resume practice until they had secured suitable office space, made the necessary alterations and installed new equipment. This entailed a loss of productive time varying from 10 to 12 weeks.

The representatives of the dental supply companies were most cooperative; they arrived in Kitchener the morning after the fire and assisted the dentists in making up inventories for insurance purposes; subsequently, the representatives facilitated the delivery and installation of new equipment.

None of the dentists was covered adequately by fire insurance. One had just lowered his coverage to \$2,000 six weeks prior to the fire. The others carried insurance ranging from \$3,000 to \$6,000, the average being \$3,900. None of the dentists was protected by business interruption insurance which would have reimbursed them for expenses of a continuing nature, such as

salaries and interest on loans, and loss of profit while they were unable to practice.

On the basis of this experience, it would seem advisable for all dentists to re-evaluate their own situation and to consider the following suggestions:

1. An inventory of each room and all contents should be made and brought up-to-date each year. One copy of the inventory should be kept at home or in a safe-deposit box; a second copy may be left with the insurance agent.
2. Fire insurance coverage should be based on the total value of the inventory.
3. Business interruption insurance should be taken; such insurance is fairly inexpensive.
4. Fireproof safes and filing cabinets should be installed to prevent loss of irreplaceable records.

Kitchener, Ontario, Canada

Some effects of soap on the skin

F. Ray Bettley. *Brit.M.J.* No. 5187:1675-1679
June 4, 1960

Views on the action of soap on the skin have changed greatly; to the Victorians, cleanliness came next to godliness, and the consumption of soap increased enormously with advances in chemical technics of the industrial revolution. The enthusiastic support of soap accorded by the Victorians was followed by a reactionary swing; some dermatologists, between the two World Wars, asserted that the effects of soap were almost wholly bad. Today, many physicians adopt a position somewhere between these two extremes.

Walker (1924, 1925, 1926) found that the antiseptic action of soap varied according to its content of fatty acid and to the bacteria studied. Price (1938) estimated that, in scrubbing the hands and forearms with soap and water, about half the total bacterial flora is removed in the first six minutes and two-thirds in the first ten minutes. Price concluded that the transient flora can be easily removed by washing, especially if the bacteria have not been allowed to remain long on the skin. He asserted that when the hands are recently contaminated by handling infected material, they can be easily cleaned and patho-

genic microorganisms removed by thorough washing of the hands with ordinary nonmedicated soap.

The property of cleansing is not altogether clear. To remove water-soluble dirt, presumably a sufficient quantity of water is all that is required. For elimination of oily or greasy dirt, the usual fat solvents could be used. However, these solvents are not suitable for repeated application to the skin. The alternative is to remove fatty material by emulsifying it. Skin cleansers therefore are surface-active substances, emulsifiers which lower surface tension at the oil-water interface and remove grease from the skin in an emulsified form. The removal of insoluble dirt particles, including bacteria, sometimes is said to result from merely floating them off the skin, but this explanation is inadequate.

The possible effect of washing on the self-sterilizing power of the skin must be considered. For many years it has been held that microorganisms deposited on the living skin are likely to die more quickly than if they are placed under comparable conditions on an inanimate surface. The skin of a cadaver loses its sterilizing power as soon as 15 minutes after death. Arnold and others (1930) asserted that the acid pH of the normal skin is important for the self-sterilizing function. Apparently, no investigations have been made of the effect of washing with soap on the self-sterilization power of the skin.

There is no doubt that the use of soap on the skin leads to loss of its normal acidity. Klauder and Gross (1951) found that after ordinary washing, the pH of the skin was restored to normal in three-quarters to two and a half hours.

Many dermatologists assert that exposure to soap predisposes to dermatitis of the hands, but if this is so, then several additional factors may be involved other than the mild elevation of pH which occurs after ordinary use of soap. There seems to be no clear evidence that maintaining

the skin surface at a pH around neutral is in itself harmful.

There is great divergence of opinion as to how often soap causes dermatitis. It is easy to believe that excessive use of soap may lead to degreasing of the corneous layer, to cracking, to some degree of soreness—changes resembling chapping.

Specific allergic sensitivity to soap is very uncommon, so that patch tests are of no value in any given instance. Statements by patients often are colored by preconceived notions. To distinguish between a primary cause and an aggravating or perpetuating factor usually is impossible.

The irritancy of soap has been ascribed variously to alkalinity, to degreasing, to the essential irritancy of fatty acids, or to a combination of these factors. Also, it has been suggested that soap itself is not an irritant, or but rarely so, and that the irritancy usually observed may result from the presence of free alkali, alkaline builders, resins or other added substances.

Soap is a common constituent of oil-resistant creams, but the effect of soap in increasing the permeability of the epidermis potentiates the effect of other irritants and sensitizers encountered during work. The use of soap-based oil-resistant creams, far from preventing industrial dermatitis, may substantially increase the risk.

Though soap has a considerable antiseptic activity, its action in eliminating bacteria from the skin surface probably is more important, particularly in regard to contamination. The power of the skin surface to sterilize itself may be impaired by washing with soap. The normal acidity of the skin surface is changed toward alkaline by exposure to soap; the consequences of this are difficult to assess. The irritant effect of soap on the skin tends to be overestimated. Such as it is, it depends on the primary irritancy of fatty acids and also on the power which soap has to penetrate into the skin.

Middlesex Hospital, London, England

Tooth abrasions, gingival injuries and daily oral hygiene

Karl Beyeler and Max Mooser.

Schweiz. Mschr. Zahnhk. 70:123-152 Feb. 1960
[in French]

Bacterial plaques on the tooth surfaces are not only a cause of dental caries, but they also promote inflammatory reactions in the gingival tissues manifested clinically by pain, redness and swelling, and histologically by hyperemia, stasis, changes in the blood and the walls of the smaller vessels and by exudations.

Many authors have assumed that the bacterial plaques can be removed easily by proper daily oral hygiene. However, not much research has been carried out on the ideal shape and size of the toothbrush, and the efficacy of dentifrices.

None of the reports published has resulted in an acceptable formulation of oral hygiene standards.

Certain manufacturers have claimed highly desirable properties for their products (toothbrushes or tooth pastes). Individual dental practitioners



Figure 1 *Tooth abrasion, exposed tooth necks and gingival injuries, probably caused by toothbrushing (inadequate brushing techniques, abrasive tooth pastes and brush with bristles which are too hard or too soft)*

have investigated and sometimes verified these claims, but the still existing diversity in opinion indicates that the problem is far from being solved.

Tooth pastes—whether or not considered of significant value for daily oral hygiene—have been developed on a basic formula (pumice flour, sodium borate, carmine, glycerin and spearmint oil) and differ only in added agents of questionable value. Toothbrushes, however, continue to appear on the market in various sizes, shapes, types and qualities.

Mechanical toothbrushing still represents the best available means of caries prevention.

The following aspects of daily oral hygiene were investigated at the Dental Institute of the

Figure 2 *Water absorption of a natural bristle (39 per cent of dry weight)*



Figure 3 *Water absorption of a synthetic (nylon) bristle (13 per cent of dry weight)*



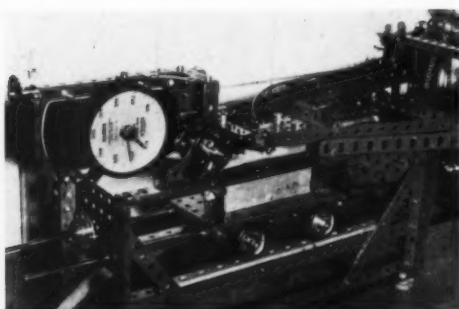


Figure 4 Apparatus recording brushing time, tooth abrasion and gingival injuries caused by toothbrushing



Figure 5 Appearance of a perfect dentition after staining with a fuchsin solution (tooth surfaces unchanged, bacterial plaques stained)

University of Bern, Switzerland: (1) size, shape and bristle quality of toothbrushes; (2) effect of tooth cleaning with toothbrush and water alone; (3) effects of natural and synthetic bristles on tooth surfaces and gingival tissue, and (4) time of toothbrushing reduced by the use of tooth pastes.

Deficient oral hygiene causes calculus accumulation and defects on the tooth surfaces and the necks of the teeth (Fig. 1). Similar conditions, however, can be produced by inadequate brushing techniques, certain properties of bristles, and excessive use of abrasives.

The advantages and disadvantages of toothbrushes with natural bristles and those with synthetic bristles have not been decisively determined. Synthetic bristles can be cleaned easier, dry quicker and exhibit a more uniform transverse section. Natural bristles cause less tooth abrasion, tooth neck defects and gingival injuries; they also

maintain their original shape better and longer.

Natural bristles—as revealed by the results of this study—take up significantly more water (39 per cent of the dry weight) than synthetic bristles (13 per cent) (Fig. 2 and 3). Both bristle types show an insignificant difference in bacterial culture after brushing. A toothbrush with synthetic bristles (used three times daily) lasts longer than a toothbrush with natural bristles (used twice daily).

The force used in toothbrushing usually is undervalued; a pressure of from 200 to 300 Gm. is required for thorough tooth cleaning involving penetration of the bristles into the interdental spaces.

A specially constructed apparatus (Fig. 4) was used to record the tooth abrasion caused by toothbrushes. Each test consisted of 84,000 brushing movements, corresponding to, approximately, a ten year use. The apparatus was used for two years and recorded 300 tooth abrasion tests, which were carried out in two groups: (1) toothbrushes with natural or synthetic bristles and water alone, and (2) the same brands of toothbrushes with various brands of tooth pastes. When water alone was used, there was no significant difference in tooth abrasion whether natural or synthetic bristles were tested. When tooth pastes were used, the test results were paradoxical: softer bristles caused more tooth abrasion than harder bristles. However, the number of bristles in brushing contact with tooth surfaces and interdental spaces played a more important part in causing abrasion than the softness or hardness of the bristles.

The cleansing effects of the following types of toothbrushes were tested: (1) nylon, soft, 1,300 bristles; (2) nylon, medium, 800 bristles; (3) nylon, hard, 600 bristles; (4) Dachs, 6,000 bristles; (5) Pro 59, 1,600 bristles, and (6) various types with natural bristles. The following brands of tooth pastes were investigated: (1) Selgin (Geigy); (2) Mexyl (Wander); (3) Binaca (Ciba); (4) Pepsodent, and (5) Settima (experimental tooth paste). Persons with a clinically perfect dentition served as test subjects. The subjects were advised to omit all oral hygiene procedures for one week to permit development of bacterial plaques. The teeth then were stained with a 5 per cent alcohol fuchsin solution. The solution was

too weak to color the tooth surfaces but sufficiently strong to stain the plaques (Fig. 5). The brushing time required for thorough tooth cleaning was recorded.

The most favorable cleaning effect was obtained by using a toothbrush with acrylic bristles, a 3 cm. long brush head and a 15 cm. long holder, in which the tips of the bristles were lying in the axis line of the holder.

For removal of the plaques without causing tooth abrasions or gingival injuries the following average time values were established: (1) 50 seconds with a mechanical acting paste (Pepsodent); (2) 70 seconds with an autolytic acting paste (Selgin), and (3) 90 seconds with tapwater.

Although the tests have indicated that tooth abrasions and gingival injuries may be caused by the abrasive components of tooth pastes, there is no evidence as to whether toothbrushing with water alone will prevent or reduce the incidence of such traumas. There is also no explanation for the fact that in the same subject some of the teeth remained free from abrasions whereas others showed significant defects (wearing away of tooth substances) under the stress of toothbrushing whether abrasive tooth pastes or brushes with horizontal bristles were used. The use of tooth pastes generally shortened the required brushing time. A healthy gingiva permits the use of brushes with hard bristles, whereas a gingiva tending to hemorrhage requires a brush with soft bristles, an especially careful brushing technic and a prolonged brushing time.

Optimal oral hygiene requires a minimal brushing time of from 2 to 4 minutes three times daily.

7 Thunstrasse, Bern, Switzerland

Mouth cleaning devices

L. Bruce Archer, John Burnaston
and John Grieves. *Design No. 139:24-33*
July 1960

A team consisting of a dentist, a research worker and an industrial design student has examined the problems relating to oral hygiene and, as a result of their findings, suggest new devices to clean the mouth.

Fundamentally, the object of ordinary mouth hygiene is to remove food debris from interprox-

mal spaces, from the crevices on the surfaces of the teeth and from the gingival pockets; to keep the mouth free from the products of food decomposition (especially those of starch and sugar), and to maintain the periodontal tissues in a firm, healthy condition.

Many primitive societies subsist on diets which obviate mouth cleaning as a distinctive operation. In other societies, fibrous roots or twigs are employed as toothbrushes. Even in some comparatively advanced societies, the flat of the forefinger is used in place of the toothbrush. In modern Western society, however, the toothbrush is the only generally accepted instrument of oral hygiene, although in some countries the toothpick is commonly employed as well.

As a cleansing device and as a stimulator of the periodontal tissues, the toothbrush has several disadvantages.

Any product—such as the toothbrush—which forms part of a man-tool-work system is as dependent on a proper attitude to the work and on an effective use of the tool as it is on the functional design of the tool. Ultimate efficiency is the outcome of all three relationships, man-tool, tool-work and man-work. For the toothbrush, the over-all efficiency is exceedingly low. The clearest evidence of this is the growing concern of the health authorities of all Western countries at the rapidly worsening mouth conditions of all their peoples. The misgivings of dental and other health authorities about the public's taste in toothbrushes, and about the public's habits in using them, are shared by the toothbrush manufacturers. Dentists in Great Britain have reported that nearly one person in every three does not own a toothbrush; many who do, make their toothbrushes last for over a year before renewing them. Investigators in both Great Britain and the United States have supported the view that a very large portion of the population in both countries either do not brush their teeth at all, or do it so infrequently or with such worn-out brushes as to make the exercise ineffectual. Not only is the toothbrush a poor tool in itself, but to be effective in reducing the caries rate it must be used more often and for longer periods of time than is generally accepted.

With the toothbrush, the man-tool relationship, or brushing habit, and the man-work relationship,

or attitude to mouth hygiene, make nonsense of any pretensions to mechanical efficiency which might be set forth for a toothbrush.

The basic idea of employing such a thing as a toothbrush for mouth hygiene must be questioned. In common usage, the toothbrush is not a very effective instrument for inhibiting the fermentation of food acids, or for stimulating the blood circulation in the periodontal tissues, and there is no reason to suppose that better instruments could not be developed. The concept of mouth hygiene being performed as a private act in the bathroom as a postscript to washing or shaving must be re-examined. The point of sale image of the toothbrush as a kind of small scrubbing brush, to be bought as cheaply as possible

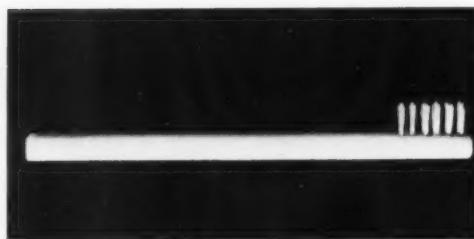


Figure 1 Mock-up of a disposable toothbrush containing tooth paste in the handle. The tooth paste is dispensed through a small nozzle among the bristles by bending the semirigid handle

and used indefinitely, must be erased and a new image substituted.

An imaginative approach to the subject might lead in several directions. For example, it might be possible to devise some way of eliminating the dietary deficiencies which cause the trouble. More practicable would be a chewing device, tougher than chewing gum, which might be capable of restoring the primitive balance of exercise, partial attrition, and scavenging. Alternatively, it might be better to accept the flaccid state of the mouth and concentrate on after-treatments, the best of which would be a means of dry brushing which could be done anywhere and at any time. Another form of after-treatment would be a syringe instead of a brush. A mouth-wash or mouth spray might produce the required effects by chemical means.

A new way of presenting toothpicks so their

use became "respectable" would go a long way toward making tooth cleaning after every meal practicable.

A chewing device of hard rubber—a substitute for the fibrous material missing from the modern diet—might restore normal mouth conditions.

The French electric toothbrush is an attempt to raise the status of mouth hygiene. Unlike the electric shaver, the electric toothbrush does not free the user from any of the conventional paraphernalia of mouth hygiene. Nevertheless, the manufacturer reports that the electric toothbrush has had good sales.

A portable toothbrush with dentifrice can be carried in the handbag or pocket and used anywhere.



Figure 2 Mock-up of mouth spray incorporating a squeeze valve in the handle

Figure 1 is a mock-up of a disposable toothbrush with tooth paste. A cheap toothbrush containing its own tooth paste (dispensed through a small nozzle among the bristles by bending the semirigid handle) might put the toothbrush into the category of a consumable item.

Figure 2 is a mock-up of a mouth spray. A spray of fine jets of water might be much more efficient than a bristle brush. A simple squeeze valve can be incorporated in the spray. The mouth spray may be the most promising instrument yet devised for correct mouth hygiene. A block of detergent might be inserted in a pocket at the tap end of the tube, to make usage more pleasant and effective.

The suggested solutions are only indications of what a systematic examination and analysis of the subject might produce.

Council of Industrial Design, 28 Haymarket, London S.W.1. England

Epidemiology of gingival disease in Kansas City, Missouri school children

William J. Carter and Jack E. Wells.
Midwest.Den. 36:21-24 May 1960

In 1956-1957, 29,500 elementary school children ranging in age from 6 to 12 years, residing in Kansas City, Mo., underwent oral examinations. The gingivitis scores were evaluated by the PMA index.

The incidence of gingivitis ranged from 37 per cent in 6 year old boys to 57 per cent in 10 year old boys. The average incidence of gingivitis for the groups was about 50 per cent.

The incidence of gingivitis increased gradually with age, this trend being more noticeable in boys than in girls. The incidence of gingivitis was higher in girls than in boys up to age 8 years, after which time it was higher in boys than in girls.

The greatest increase in the incidence of gingivitis, in both boys and girls, came between age 6 years and age 7 years.

The papillae and margins were the most common gingival units attacked, and were almost equally affected in each age group studied. The average papillary inflammations ranged from about one unit in 6 year old children to almost two and a half units in 12 year old children. The incidence of gingival margins affected was similar to that of papillae.

When the results of the Kansas City study were compared with those found in suburban Chicago school children by Massler, Schour and Chopra (1950), it was noted that the incidence of gingivitis was lower but the severity of gingivitis was higher in the Kansas City children.

*School of Dentistry, University of Kansas City,
Kansas City, Mo.*

Status of fluoridation in the United States and Canada, 1958: task group report

Robert S. Phillips. *J.Am.Water Works A.*
52:301-307 March 1960

The use of fluoridated water supplies in North America continued to increase steadily in 1957 and 1958. By the end of 1958, more than 36,000,000 people were drinking water provided

by 1,000 systems that were adding controlled amounts of fluorine (fluoride ions) to water supplies. In the United States, this growth of fluoridation, although steady, has not been as spectacular as during the period from 1950 to 1953. Seventy-eight per cent of the increase in systems adding fluorine in the past two years has been in communities with populations of less than 25,000. By the end of 1958, nearly 40 per cent of all communities in the United States with populations of 10,000 or more were using fluoridated water. Even in the smallest population groups—communities with populations of 1,000 to 2,499—338 communities were using fluoridated water by the end of 1958.

Sodium silicofluoride continues to be the chemical used by most water systems, large and small. More than 50 per cent of all systems in the United States, which serve 20,588,802 people, are adding sodium silicofluoride to their supplies. Sodium fluoride is used by a large number of the smaller systems; the use of fluosilicic acid is growing among small and large communities. Only two communities use calcium fluoride, and no ammonium fluosilicate installations have been instituted since 1954.

In 1958 a survey by the American Water Works Association showed that the supply of fluosilicic acid was critical, but that ample supplies of both sodium silicofluoride and sodium fluoride were available.

American Water Works Association, 2 Park Avenue, New York 16, N.Y.

Action of fluorine in prevention of dental caries

German M.Monthly 5:62 Feb. 1960

Q.—What is the mode of action of fluorine (fluoride ion) in the prevention of dental caries?

A.—Present knowledge of the action of fluorine in prevention of caries is still inadequate. Several authors have assumed that fluoride acts not only intraorally but endogenously. Localized caries-reducing effects produced by deposition of fluorine in the enamel have been demonstrated. The enamel's acid solubility is significantly decreased and the organism's physical resistance to caries is increased. The effect, however, varies from in-

dividual to individual, and even from tooth to tooth. Knappwost explained the local action of fluorine on the basis of his "surface layer theory." During the first phase a calcium fluoride layer is formed on the surface enamel; during the second phase—which is more prolonged—hydroxyapatite is converted into fluorohydroxyapatite. Leimgruber stated that fluorine is responsible for producing cohesion of the enamel prism. According to Baume an as yet undetermined factor influences the cuticle layer of enamel favorably. Introrally consumed fluoride exerts a bactericidal action and inhibits enzyme growth.

The amount of fluorine required for caries-preventive purposes such as fluoridation of drinking water (1.0 ppm fluorine) is far too small to produce any significant bactericidal or bacteriostatic effects directly. Lammers, however, reported that fluorine (3.0 ppm) definitely inhibits the growth of *Streptococcus salivarius* and of *Lactobacillus acidophilus*. Endogenously consumed fluorine reduces the metabolism of proteins in body tissues, increases the flow of saliva and promotes the formation of enamel layers protecting the outer tooth surfaces. As yet, however, experiments have not been extensive enough to permit formulation of definite conclusions on the over-all actions of the various mechanisms of fluorine in the prevention of dental caries.

Waldauweg 6, Bonn, Germany

**Results of the 1959 dental survey,
Milwaukee, Wisconsin, after six years
of fluoridation**

William E. Schultz and Mary Jeanne Bowen.
J. Wisconsin D.Soc. 36:3-4 Jan. 1960

A dental survey to determine the present state of dental health of Milwaukee children and to determine the extent to which improvement may have resulted after six years of fluoridation was conducted in October 1959 by the City of Milwaukee Health Department. The results were compared with a prefluoridation baseline survey performed in 1950. In the 1959 survey, only children with a history of continued residence in Milwaukee since birth were selected; 4,660 children from 20 schools were examined. The results of the 1959 survey prove the benefits of water fluoridation.

In 1950 the average six year old child had a def rate of 4.61. In 1959, this figure was reduced to 2.94. In 1950, the average DMF rate for all ages 6 through 14 years was 4.07. In 1959 the average DMF rate was 2.46, an over-all reduction of 39.5 per cent. In 1950 the average seven year old child had a DMF rate of 1.29, and in 1959 a DMF rate of 0.53, a reduction of 59 per cent.

The fluoridation of Milwaukee water was started July 22, 1953. Sodium silicofluoride at a concentration to yield a fluorine (fluoride ion) content of 0.9 ppm is used. During the summer, when a higher consumption of drinking water is inevitable, the concentration is reduced to 0.7 ppm. The cost of fluoridation in Milwaukee has been about five and a half cents per person per year.

Dental Division, Milwaukee Health Department, Milwaukee, Wis.

**Studies on the physical properties
of fluorosed enamel—II. Microhardness**

E. Newbrun. *Arch.Oral Biol.* 2:21-27 May 1960

Thirty permanent anterior teeth were collected from persons who had lived continuously in Alamosa, Colo.; Colorado Springs, Colo.; Doland, S. D., and Post, Texas, where the water supplies contain 1.5, 2.6, 2.9 and 5.0 ppm fluorine (fluoride ion), respectively.

At least ten microhardness measurements were taken on each tooth with a Kentron microhardness tester, and the average was recorded as the Knoop hardness number of the tooth. The average hardness of teeth from each area was compared with the average hardness of teeth from persons in Birmingham, Ala. (0.00 to 0.03 ppm fluorine in the water).

The average Knoop hardness numbers for the teeth from the various localities were as follows: Post, 305 ± 24 ; Doland, 355 ± 20 ; Colorado Springs, 268 ± 34 ; Alamosa, 396 ± 17 , and Birmingham, 365 ± 35 and 367 ± 35 . The teeth from Colorado Springs and from Post, therefore, were significantly softer than those from Birmingham, but the teeth from the other communities did not differ significantly in hardness from those from Birmingham.

The present investigation shows that the greater the degree of dental fluorosis the lower the Knoop hardness of the enamel. This finding appears at first to be inconsistent with previously reported data showing an inverse relationship between fluorine content and enamel solubility. It is a popular misconception that solubility and hardness run parallel. The microhardness of sound enamel and dentin does not differ on the average from the microhardness of sound portions of enamel and dentin from carious teeth. Tooth hardness is independent of the number of carious lesions in the teeth. Fluorotic teeth can be softer than normal teeth and still remain more resistant to decay.

Systemic effects of fluorine on enamel hardness do not become apparent until the fluorine level in the water supply exceeds 1.5 ppm. The teeth from Alamosa (1.5 ppm fluorine in the water) were harder, though not significantly so, than the teeth from the low fluorine areas, and significantly harder than teeth from areas in which the water is high in fluorine. This suggests there may be an optimal level of fluorine concentration for enamel hardness as there is for dental caries and mottled enamel, and that this value lies somewhere between 0.15 and 2.6 ppm fluorine in the water.

Medical Center, University of Alabama, Birmingham, Ala.

Group financing of dental care—what it means

Walter J. Pelton. *J. Dist. Columbia D. Soc.*
35:2-7 June 1960

The Division of Dental Resources, Public Health Service, U.S. Department of Health, Education, and Welfare is concerned chiefly with ensuring the continued availability of adequate dental services and with encouraging their more complete utilization.

Although dental diseases are universal and every person therefore is a potential dental patient, only about 40 per cent of the public sees a dentist in a single year. Nonutilization of dental services does more than anything else to dilute the effectiveness of dentistry. The division is planning a research project to find out how much

such attitudes as ignorance, indifference or fear contribute to nonutilization of dental services, and how such attitudes can be overcome.

If all families with some high school training in their background were to use dental care to the same extent as those do who have better than average incomes, 15,000,000 more people would be added to the number now seeking dental care.

The phenomenal growth of medical care plans suggests an obvious answer for dentistry. Today in this country perhaps 750,000 people have some type of dental coverage. Compared to the 123,000,000 people covered by various medical plans, this is not impressive. But when one recalls that it is more than double the number who had dental coverage two years ago, it takes on more importance. Health insurance figures show that once three or four million people had coverage for regular medical expense, the demand for such coverage began to snowball.

The trade union movement has announced that dental insurance will be high on the list of contract demands over the next ten years. At three persons per family, and with 13,500,000 union members, that could mean routine dental care for 40,000,000 people in a single decade.

Although the official position of the American Dental Association is commendable in its endorsement of the prepayment principle, the action taken by state and local dental groups has ranged from intelligent development of plans through cool aloofness to opposition.

At one time the American Medical Association announced its unalterable opposition to medical care plans. Today, some 1,200 medical plans have 123,000,000 subscribers. Of 15 billion dollars spent annually for medical care, the amount spent for health insurance premiums is 5.9 billion dollars—or three times the 1.7 billion dollar dental bill paid by the American public. Today, nearly 80 per cent of the nation's physicians favor medical insurance.

Today about 200 different dental plans are in operation. The missing ingredient in both the clinic plan and the indemnity plan written by a commercial carrier is flexibility of financing. What is required are dental care programs which: (1) provide the highest possible standards of dental care at a reasonable cost to the patient; (2) protect the ethical and economic interests of the

dentist; (3) encourage utilization of dental services without inviting abuses, and (4) meet the requirements of large segments of the population, but are adaptable to the peculiar needs of small groups.

The dental service corporation is not a prepaid dental care plan but a mechanism for providing such plans. Because it is organized and controlled by dentists, it will be alert to the economic and ethical interests of the dental profession. Since the corporation's reason for being is to provide programs for the particular state or community in which its members practice, its officers will be more alert to local needs and better able to develop programs to meet them. The corporation can control quality standards, something about which commercial indemnity plans do not concern themselves. Sponsored by dentists, the dental service corporations are in a position to affect the entire approach to dental care. The corporations can educate patients and plan-administrators in the value of preventive dentistry.

Although clinics, panels, commercial insurance programs and nonprofit service corporations are legal and acceptable methods of handling prepayment dental care, the most likely plan to give greatest geographic coverage, to allow for professional guidance and to give the patient the most service for his money is the dental service corporation.

Division of Dental Resources, 3330 Health, Education, and Welfare Building S, Washington, D.C.

**Incidence of dental caries
in Czechoslovakian school children
during the period of from 1949 to 1953**

Vratislav Bažant and Josef Miksa.
Ceskoslov stomat. 60:162-166 May 1960

From 1949 to 1953, the dental health of 5,000 Czechoslovakian school children, selected at random, was determined by periodic examinations at the Second Stomatological Clinic of the University of Prague.

The investigation of this group had been requested by the Public Health Department of the Czechoslovakian government and was designed to establish the percentage of school children re-

quiring immediate dental care. The group consisted of 2,500 boys and 2,500 girls who were, at the time of the initial examination, between 6 and 14 years old. The children were of different national origins (Czechs, Slovaks, Germans, Hungarians, Ukrainians and Poles).

The percentage of children requiring dental care of deciduous teeth ranged from 20 per cent to 90 per cent, according to the chronologic age. The percentage of children requiring dental care of permanent teeth ranged from 50 per cent to 95 per cent. The def index in 6 year old children was 1.45 whereas in 12 year old children, it was 0.60. The DMF index in 6 year old children was 1.50 whereas in 14 year old children, it was 6.55.

The result of the investigation demonstrated that the number of teeth filled or otherwise restored was statistically insignificant, therefore the conclusion seems justified that the average Czechoslovakian school child requires urgent, immediate dental care.

Second Stomatological Clinic, Prague 2, Czechoslovakia

**Correlation between malocclusion,
oral habits, and socioeconomic level
of preschool children**

Louis J. P. Calisti, M. Michael Cohen
and Martha H. Fales. *J.D.Res.* 39:450-454
May-June 1960

In May 1958, there were 491 preschool children, ranging in age from three years eleven months to five years four months, who received a dental examination, including an orthodontic evaluation, as part of a complete physical examination. The children were grouped according to socioeconomic level.

No statistically significant relation was found to exist between socioeconomic level and type of malocclusion. The relation between incidence of oral habits and of malocclusion was statistically significant. The habits in this study were related to such actions or conditions as finger sucking and similar hand pressures, fingernail biting, tongue habits, and lip or cheek habits.

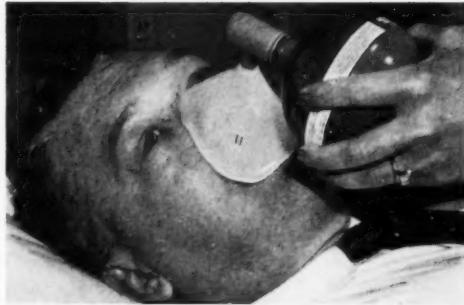
Seventy-one per cent of the children had no anterior spacing in the deciduous dentition.

Brookline Health Department, Brookline, Mass.

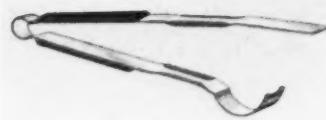
New equipment

The information reported here is obtained from manufacturers. Dental Abstracts does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.

A new and stronger steel has been developed for use in an emergency oxygen-giving device. The container, with a diameter of four inches, weighs only 32 ounces, yet houses a 20-gallon, 60-minute controlled-flow oxygen supply. An hour's supply of oxygen for emergency use previously has been available only from cylinder-shaped "continuous-flow" apparatus weighing as much as 125 pounds, it is claimed. The oxygen device is recommended for use by dentists and physicians. The steel was developed by *Great Lakes Steel Corp., Division of National Steel Corp., Grant Bldg., Pittsburgh 19, Pa.*

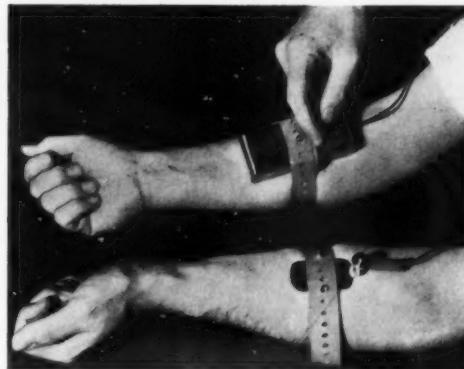


The characterization of new "AEsthetic" characterized teeth includes simulated fillings, decalcification areas, irregular incisal edges, neck stains, line stains, incisal stains on lower teeth, and darker shading. The multifired porcelain anterior teeth are described as a companion product to the line of AEsthetic teeth. *Myerson Tooth Corp., 66-90 Hamilton St., Cambridge 39, Mass.*



A pair of stainless steel casting ring tongs is offered free with the purchase of six cans of "Micra-Gel" elastic impression materials. One side of the tongs is curved to hold the ring firmly. The other side is flat to allow the operator to more easily rearrange, place or remove inlay rings. The dental tongs have black walnut handles. *Surgident Ltd., 3871 Grand View Blvd., Los Angeles, Calif.*

Anesthetized patients in dental clinics and offices can be provided with a new safeguard, a small, self-contained "Veling" heart monitor. The instrument weighs 6 ounces and is less than 5 inches long. When strapped to the patient's arm, the monitor emits a "beeping" signal. The amplified electrical impulses are said to provide a quicker and more accurate indication of heart condition than can be obtained by monitoring only the sounds of heartbeat, the blood pressure or pulse. The heart monitor utilizes a low-voltage mercury battery and a transistorized amplifier. An electrode, connected to the monitor by a small wire, is strapped to the patient's other forearm. *National Cylinder Gas Division, Chemetron Corp., 840 N. Michigan Ave., Chicago, Ill.*



Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

The characteristics of a masticated bolus of peanuts prepared for deglutition in humans with apparently normal occlusions. *Joseph P. Allgood.* 1960. *M.S. Northwestern University.*

The effect of heat treatment on the mechanical properties of orthodontic cobalt-chromium steel wire as compared with chromium-nickel steel wire. *Robert William Mutchler.* 1960. *M.S.D. Northwestern University.*

A radiographic comparison of the reliability of an ear-rod and a supraorbital cephalostat; and an evaluation of the Frankfort horizontal plane. *Peter Bugbee Sanderson.* 1960. *M.S.D. Northwestern University.*

Forces used for cuspid retraction. *Clarence C. Witmer.* 1960. *M.S.D. Northwestern University.*

Pigmentation and esthetics of the denture base for colored peoples. *Alexander Anthony Calomeni.* 1959. *M.S. Washington University.*

Evaluation of the rest position as a guide to prosthetic treatment. *Elmer Taylor Duncan.* 1959. *M.S. Washington University.*

Permanent maxillary canine eruption pattern. *Arthur Sigmund Gorny.* 1959. *M.S. Washington University.*

Perioral profile change in orthodontic treatment. *Leonard Arthur Bloom.* 1960. *M.S. Washington University.*

Emission of mercury from amalgam fillings: a new investigation method with Hg^{203} (Die Quecksilberabgabe aus Amalgamfüllungen: eine neue Untersuchungsmethode mit Hg^{203}). *Ingrid Keibel.* 1959. *DR.MED.DENT. University of Göttingen, Germany.*

Relations between the tissue tolerability of the esters of polymethacrylic acid and the degree of polymerization (Über die Abhängigkeit der Gewebsverträglichkeit der Polymethacrylsäureester vom Polymeriastiongrad). *Bärbel Striebel.* 1960. *DR.MED.DENT. University of Halle/Saale, Germany.*

Relation between the orbitale and the cuspid in teleroentgenograms of the profile (Die Relation zwischen Orbital und Eckzahn am Fernröntgenprofilbild). *Wilhelm Peitsmeier.* 1959. *DR.MED.DENT. University of Hamburg, Germany.*

Position of the axes of the lower anterior teeth in relation to the planes of the mandible and to the angle of the jaws (Die Achsenstellung der unteren Frontzähne im Verhältnis zur Unterkieferbasis und zum Kieferwinkel). *Susanne Jansen.* 1959. *DR.MED.DENT. University of Hamburg, Germany.*

Critical observations of autoplasic and heteroplasic implants inserted for prosthodontic reasons: experimental investigations in patients, tissue sections and tissue cultures to determine reactions to dental materials (Kritische Beobachtungen der autoplastischen und heteroplastischen Implantationen auf zahnärztlich prothetischen Gebiet: experimentelle Untersuchungen an Patienten, Gewebeschnitten und Gewebekulturen unter Berücksichtigung werkstoffkundlicher Belange). *Rolf Schwindling.* 1960. *DR.MED.DENT. University of Heidelberg, Germany.*

Influence of age on the formation of metastases in stomach, large intestine and bronchi from primary oral tumors (Der Einfluss des Lebensalters auf die Metastasenbildung im Magen, Dickdarm und den Bronchien vom primären Tumoren der Mundhöhle). *Susanne Weber.* 1959. *DR.MED.DENT. University of Heidelberg, Germany.*

Investigations of the thermal conductivity of the various chemicophysical compounds (Untersuchungen über die Wärmeleitfähigkeit verschiedener physikalisch-chemischer Verbindungen). *Amir Nasser Hascheminejad*. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Review of the case histories of patients treated at the Dental Clinic of the University of Heidelberg from 1956 to 1957: based on the structural, diagnostic, sociologic and sociomedical viewpoints (Untersuchungen über das Krankengut der Klinik und Poliklinik für Mund-, Zahn- und Kieferkrankheit der Universität Heidelberg in den Jahren 1956 und 1957: unter strukturellen, diagnostischen, soziologischen und sozialmedizinischen Gesichtspunkten). *Peter Katzorke*. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Investigation of the blood cholesterol values in clinically healthy persons: especially in regard to tooth conditions (Untersuchungen über den Blutcholesterinspiegel bei klinisch gesunden Personen: unter besonderer Berücksichtigung der Zähne). *Heinz Lopp*. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Historic development of the term "parulis" (Die historische Entwicklung des Begriffes "Parulis"). *Kurt Gerhard Lorber*. 1960. DR.MED.DENT. University of Heidelberg, Germany.

Limitations and significance of tests carried out to demonstrate the usability of dental materials for prosthodontic practice (Über die Grenzen und Bedeutung von Werkstoffprüfungen im Lichte klinischer Prothetik). *Herbert Radczewski*. 1959. DR.MED.DENT. University of Kiel, Germany.

Experimental studies to determine the penicillin concentration in the dentin liquid of human teeth after submucosal injection or oral administration of "Omnacillin" or "Oratren" (Experimentelle Untersuchungen zur Bestimmung der Penicillinkonzentration im Dentinliquor menschlicher Zähne nach submucöser oder oraler Gaben von "Omnacillin" beziehungsweise "Oratren"). *Alfred Maul*. 1959. DR.MED.DENT. University of Kiel, Germany.

Effects of silver nitrate, eugenol and "Dentilith" on the dental pulp of juvenile patients (Die Einwirkung von Silbernitrat, Eugenol und "Dentilith" auf die Pulpae von jugendlichen Patienten). *Dimitrov Hristosov*. 1959. DR.MED.DENT. University of Mainz, Germany.

Cytodiagnosis of the normal oral mucosa (Ein Beitrag zur Cytodiagnostik der normalen Mundschleimhaut). *Uwe Schröder*. 1959. DR.MED.DENT. University of Münster, Germany.

Determination of the oral condition of boys and girls, 14 years old, attending the schools of the district of Lübbecke in Westphalia (Untersuchungen über die Zahn-, Mund- und Kieferverhältnisse der 14jährigen Schüler und Schülerinnen des Kreises Lübbecke in Westfalen). *Hans Leyk*. 1959. DR.MED.DENT. University of Münster, Germany.

Caries-preventive effects of orally administered Vanadium in Syrian hamsters (Die kariesprophylaktische Wirksamkeit per os verabreichten Vanadiums bei syrischen Hamstern). *Inge Peters*. 1959. DR.MED.DENT. University of Tübingen, Germany.

Kinetics of fluoridized hydroxyapatite in regard to local caries prevention (Die Kinetik der Fluorierung von Hydroxylapatit im Hinblick auf die lokale Kariesprophylaxe). *Helga Euchenhofer*. 1960. DR.MED.DENT. University of Tübingen, Germany.

Experimental investigations of the exchange of ions between fluorine and hydroxyl within hydroxyapatite (Experimentelle Untersuchungen über den Jonenaustausch zwischen Fluor und Hydroxyl in Hydroxylapatit). *Sabine Wüterich*. 1959. DR.MED.DENT. University of Tübingen, Germany.

Mercury vapor pressure measurements of dental amalgams by absorption of the resonance line at 2,537 angstroms (Quecksilber-Dampfdruck-Messungen an Dental amalgamen durch Absorption der Resonanzlinie bei 2537 Angströms). *Erich Fink*. 1959. DR.MED.DENT. University of Tübingen, Germany.



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